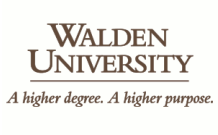

2020

Exploring Trust in Cloud Computing for a Governmental Organization in Ethiopia: A Case Study

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This is to certify that the doctoral dissertation by

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has been found to be complete and satisfactory in all respects,
and that any and all revisions required by
the review committee have been made.

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Abstract

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Dissertation Submitted in Partial Fulfillment

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Abstract

Organizations face a rapidly changing environment that forces them to seek high computing power. The problem was how to overcome factors that cause managers at governmental organizations in Ethiopia to be reluctant to trust cloud computing, while some managers overcame this lack of trust. The purpose of this qualitative, single case study was to provide a deeper understanding of how a governmental organization in Ethiopia overcame the factors that adversely influenced managers of other organizations to the extent that they distrusted and decided against adopting cloud computing. The population for this study was comprised of 12 managers from a governmental organization in Ethiopia who had successfully overcome the negative factors and, consequently, decided to trust and adopt cloud computing. The conceptual framework for this study was derived from the technology-organization-environment model. Data were collected using semistructured interviews, observing meetings, and reviewing organizational documents. Thematic analysis techniques were used in coding the data and developing themes. The emergent factors that helped managers to overcome negative factors included building trust in, and forming agreements with, cloud service providers; being a good follower; having senior management support; and meeting customers' demands. The recommendation is to establish a telecom regulatory authority to improve the infrastructure of the country. Decision-makers should consider policies to enhance the success of cloud-based service implementations. The results of this study could contribute to economic growth by firms in adopting cloud computing to automate their services which could lead to positive social change within the population.

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Dedication

This dissertation is dedicated to the memory of my father, Seyoum Abebe, who indicated, even when I was still at a young age, that I would one day become a doctor. Unfortunately, he did not stay in this world long enough to see his son become a doctor. He taught me to persevere and prepared me to face challenges with faith and self-effacement. He was a constant source of inspiration in my life. Although he is not here to give me strength and support, I always feel his presence, which urged me to strive to achieve my goals in life. I miss him every day, but I believe that he is watching over this process through to its completion, offering the spiritual support that makes it possible. This dissertation is also dedicated to my wife, Tsion, who has been a constant source of support and encouragement during the challenges of the doctoral program as well as throughout life in general. The completion of this dissertation would not have been possible without her assiduously caring for the kids and dealing with me. I have put many hours into this program, traveling back and forth between three countries in three different continents (the USA, the UAE, and Ethiopia). I am genuinely thankful for having her in my life. The last portion of my dedication is to my kids, Emmanuel, Eleni, Saba, Eyob, Keren, Eldana, and Arsema, all of whom have always loved me unconditionally and set a good example that inspired me to work hard to achieve my aspirations.

Acknowledgments

The completion of this dissertation would not have been possible without the support and encouragement of several special people. Hence, I would like to take this opportunity to show my gratitude to those who have assisted me in a myriad of ways. I would first like to express my heartfelt thanks to my chair, Dr. Anthony Lolas. I could not have asked for a more supportive and considerate supervisor. There were many times at which I reached the *crossroads* and, each time, Dr. Lolas was there to steer me towards the right path. He was prepared to sit and listen to my troubles and always made me feel as if my work mattered. His willingness to offer me so much of his time and intellect is the primary reason that this dissertation was completed. Thank you so much, Dr. Lolas. Within the University, I also had the support of my SCM, Dr. Robert Kilmer: thank you for your helpful advice and support. Additionally, special thanks go to Dr. Kerry Mitchell, my URR. Her assistance and the grace with which she handled all my questions are much appreciated. I also had the good fortune to study with some talented people: Dr. Lolas' students. Their ability to remain upbeat at all times, despite their difficulties, provided me with a balanced perspective that I will always retain.

I want to thank you for my research partner organization. They were wholeheartedly supportive of issuing a letter of cooperation to the last participant I interviewed. They allowed me to participate in their internal meetings freely and provide me with all the documents I need to fulfill my research requirements. They are the best! Finally, I would like to thank my family to whom I owe a great deal. To my late father, Seyoum Abebe: thank you for showing me that the key to life is enjoyment. Also, thanks

to my kids for their unconditional love and support. And, finally, the one person who has made all this possible has been my wife, Tsion Abeselom. She has been a constant source of support and encouragement and has made an untold number of sacrifices for the entire family, specifically for the kids and for me to continue my program. She is a great inspiration to me. Hence, great appreciation and enormous thanks are due to her for, without her understanding, I am sure that this dissertation would never have been completed. I thank you all.

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Chapter 1: Introduction to the Study

Since the turn of the 21st century, information and communications technology (ICT) has advanced at an unprecedented scale and pace. Cloud computing is considered to be the third uprising of the ICT industry, directly following the rise of personal computing and the internet (Yang & Tate, 2012). The benefits of cloud computing enabled businesses around the globe to accelerate the rate of economic growth by leveraging electronic government (e-government) services and technological advancements (Mohammed, Ibrahim, & Ithnin, 2016). The cloud computing system delivers an excellent foundation for addressing some of the traditional ICT challenges, such as high-cost local ICT infrastructure. In all governmental organizations, there are two top drivers regarding the adoption of cloud computing: the effective delivery of services and the need to be cost-effective. In Gartner's research, Meulen (2018) forecasted that almost half of all governmental organizations are actively using cloud computing for their e-government services, with an average growth of 17.1% per year in spending for cloud computing through to 2021. The challenges in developing countries are regulatory, procedural, organizational, and technical issues for individual organizations.

In the tenth edition of the United Nations' 2018 e-government development index survey, researchers reported that the average e-government development index score for African countries was 0.3423, which was significantly lower than the world average index score of 0.66 (United Nations, 2018). In Africa, the relatively poor telecommunication infrastructure hindered the country's e-government advancements.

The emergence of cloud computing creates new challenges, uncertainties, and anxieties for governments in developing countries such as Ethiopia, who may now have to consider cloud computing, despite their initial distrust and resistance to using it for e-government services. Cloud computing may solve most of the service issues in the country; however, most of governmental organizations' managers do not use it in Ethiopia. The results of this study in understanding why some managers of a governmental organization did overcome the negative factors will help other organizations' managers to trust and adopt cloud computing for their e-government services.

The purpose of this qualitative, holistic, single case study was to provide a deeper understanding of how a governmental organization in Ethiopia overcame the negative factors that have adversely affected managers to the extent that they distrusted and decided against adopting cloud computing for e-government services. The primary focus was to consider managers at different levels of a governmental organization in Ethiopia. The managers who were involved in this study included a chief information officer (CIO), directors, managers, project managers, and department heads. All the participants had been involved in the process of adopting the cloud to be used at the organization. The results of this study may help the managers at private organizations to automate their business processes. Furthermore, the findings of this study may lead to positive social change in terms of helping to save the environment by managers who avoid using local polluting hardware when they adopt cloud computing for e-government services.

Chapter 1 is structured as follows: After introducing the study, I present the background of the study, followed by the problem statements, the purpose of the study,

and the research questions. Next, I identify and define the concept or phenomenon in the context of a conceptual framework and describe the key concepts that I investigated throughout this study. Then, I provide definitions of key concepts, clarify the assumptions, and define the scope and delimitations, as well as the limitations of the project. Finally, I offer a transition to Chapter 2 by highlighting the significance of the study and summarizing the main points of Chapter 1.

Background of the Study

E-government denotes the use of ICT for government services. E-government is used as a tool to enhance the concept of governance in terms of transparency of governmental functions for customers who participate in the system electronically, thereby resulting in a higher level of government service efficiency (Ojo, 2014). Globally, many managers of governmental organizations have acknowledged the significant opportunities that cloud computing provides in terms of improving the effectiveness of their organization's internal processes as well as delivering better services to customers. Conversely, the managers at governmental organizations who have ignored the emergence of cloud computing could suffer by providing ineffective services to their customers. This could, in turn, result in them experiencing other crucial competitive disadvantages (Mohammed, Alzahrani, Alfarraj, & Ibrahim, 2018).

The primary ramification of governmental organizations' managers ignoring the emergence of cloud computing is their inability to address governance challenges such as poor governmental management, including a lack of responsibility and even corruption. Regarding traditional ICT infrastructures, Ebrahim and Irani (2005) indicated that the

implementation of e-government services is costly, requires a skilled workforce, and involves enormous risk. In developing countries, there is an increasing demand to exploit opportunities to implement e-government systems. Ebrahim and Irani also noted that the introduction of cloud computing could be used as a tool to improve governance, but it requires that organizations possess proficient technical capabilities and robust technological systems.

In developing countries, there is a lack of readiness for e-government due to a lack of resources, a lack of ICT skills, poor technology infrastructure, and low levels of education and literacy (Ali, Mazen, & Hassanein, 2018; Mohammed et al., 2016). The scarcity of critical skills and the absence of the required infrastructure prevent the managers of governmental organizations from implementing cloud computing services. The most critical obstacles and challenges for cloud computing services in developing countries are financial resources, human resources, and proper ICT infrastructure (Dornelas, Rodrigues de Souza, & Amorim, 2017; Mahmoodi & Nojedeh, 2016). Several reports have presented the significant obstacles and challenges that position developing countries behind developed countries.

Recent reports from the International Telecommunication Union (ITU), Economist Intelligence Unit, United Nations, and World Economic Forum indicated that several developing countries have low indices when it comes to human capital, ICT infrastructure, and connectivity (Bilbao-Osorio, Dutta, & Lanvin, 2013; ITU, 2012). Due to all these problems for many developing countries, the process of seeking to implement e-governments by using cloud computing is a challenging one as it is difficult to meet the

e-government requirements. As a result, most developing countries' e-government services were unable to deliver the promised effective and efficient governmental services; the managers of those governmental organizations still struggle with the problems of ineffective government services due to the insufficient use of ICT and cloud computing (Al-Rashidi, 2013). Despite all these challenges, most governmental organizations in developing countries are now facing the genuine possibility of an uprising by their users who demand the improvement of e-government services (Ali et al., 2018).

Ali et al. (2018) stated that the rapidly increasing demands from users are affecting governmental organizations by placing ever more enormous pressure on their e-government services and infrastructure to improve current, and to develop new, services. The process of undertaking such improvements incurs ICT infrastructure costs and results in increased expansion regarding data and application use, migration challenges, and the need for software licensing and support as well as the management and integration of hardware and software. Because of its benefits and competitive advantages, several countries have deployed cloud computing for e-governance (Sharma & Panigrahi, 2015). For instance, the main federal government information portal in the United States (USA.gov) adopted a cloud-based solution to overcome challenges such as extended downtime, massive network traffic loads, and inefficient services. Mohammed et al. (2016) reported that the migration of General Service Administration services to the cloud reduced the site upgrade time from 9 months to 1 day, reducing the downtime by 99.9% and cutting the cost of ICT operations by 73% annually.

For this literature review, I only found a few studies that investigated cloud computing for governmental organizations from the e-government context, and most of these studies mainly discussed the challenges and benefits of cloud computing for e-governments. For instance, Mohammed et al. (2016) reviewed and analyzed relevant research papers that focused on the challenges, barriers, and critical success factors for the implementation of e-governments. Mohammed et al. (2016) concluded that a lack of resources, technological barriers, a lack of awareness, poor management, and a lack of ICT infrastructures were the most commonly experienced challenges and obstacles for developing countries. Mohammed et al. (2016) concluded that such problems and critical factors have contributed to a high level of distrust in the cloud computing sector. However, scholarship to date has not explained or provided a deeper understanding of how a governmental organization in a developing country could, and had, overcome those factors that adversely influenced managers of other organizations to the extent that they distrusted and decided against adopting cloud computing for e-government services. Through this study, I intended to address this gap in the research literature by offering insights into how a governmental organization in a developing country such as Ethiopia overcame the factors that adversely influenced managers of other organizations to the extent that they distrusted and decided against adopting cloud computing for e-government services.

There is a lack of studies that propose frameworks with which to explore managers' levels of confidence and trust in adopting cloud computing for the implementation of e-government services. For instance, Chou (2015), and Sallehudin,

Razak, and Ismail (2015) proposed frameworks to explore the factors that have affected the adoption of cloud computing for e-government services in governmental organizations. However, these researchers had not provided frameworks that afforded deeper understandings of how governmental organizations in developing countries overcame the factors that adversely influenced managers of other organizations to the extent that they distrusted and decided against adopting cloud computing for e-government services. Kuiper et al. (2014) concluded that several factors that affect the adoption of cloud computing by e-government services require further research in the contexts of the cultures, climates, politics, legislation, and economies of developing countries. Hence, the current literature exhibits a significant gap in research in terms of failing to provide a deeper understanding of how governmental organizations in developing countries might overcome the negative factors that influenced managers of other organizations to the extent that they distrusted and decided against adopting cloud computing for e-government services.

Problem Statement

In recent reports from the 10th edition of the United Nations' 2018 E-Government Development Index Survey, researchers indicated that, while most of the developed nations had attained either high (0.50-0.75) or very high (> 0.75) index scores, countries in Africa and the Middle East exhibited either low (< 0.25) or middle level (0.25-0.50) index scores (United Nations, 2018), placing them far behind developed nations in terms of e-government development. The average e-government development index score for African countries was 0.3423, which was significantly lower than the world average

index score of 0.66. The e-government development index is used as a composite indicator to measure the willingness and capacity of governmental organizations to use ICT to deliver public services. Developing countries that decided to overlook the value of emergent new technologies may not be able to (a) deliver effective governmental services, (b) convey a sense of transparency in relation to governmental functions and operations, and (c) ensure the participation of its customers through the medium of e-governance (Ojo, 2014). The notably low value of the United Nations' e-government development index score for Africa demonstrated that ignorance about the value of the new technologies that are emerging causes problems for various nations and, thus, warrants further exploration.

To date, the efforts of most of the organizations in Ethiopia that have sought to provide e-government services had not lived up to the citizens' expectations of effective and efficient government services. The government is still struggling in its attempts to provide better services to its customers due to the insufficient use of technology such as cloud computing (Lixi & Dahan, 2014). Two years after Lixi and Dahan's (2014) investigation in Ethiopia took place, some governmental organizations began to migrate their front-end applications, such as mobile applications (or *apps*) and web-based tools, to the cloud. The general research problem was how to overcome factors that cause most of managers at governmental organizations in developing countries such as Ethiopia to be reluctant to trust and adopt cloud computing for e-government services, especially while some managers of a governmental organization overcame this lack of trust. The transition from traditional ICT, such as local infrastructure, local data centers, and local servers, to

cloud computing, was a problem for all levels of management; staff struggle to accept cloud computing as a part of their e-government services strategies (Kajiyama, Jennex, & Addo, 2017).

Moreover, managers at such organizations encountered difficulties as a result of allowing third parties to maintain and to safeguard their data. Even though the conception of trust in the context of cloud computing might be different from that of other professional environments, Kajiyama et al. (2017) agreed that the high levels of uncertainty surrounding issues of security constitute the number one obstacle to the widespread use of cloud computing. Security was not the only obstacle that affected organizations' decision-making processes regarding whether to trust in cloud computing. Privacy was another critical concern; indeed, it was the next most significant obstacle to encouraging others to adopt cloud computing, due to fears about unauthorized data exploration as well as the potential misuse of information without customers' consent (Kalloniatis, 2017). Even though the issue of security and privacy has been discussed among scholars, an explanation as to how a few governmental organizations in Ethiopia have, in fact, overcome this lack of trust while most of the managers at governmental organizations in Ethiopia were reluctant to trust cloud computing for use in e-government services is still missing from scholarly discussions. The specific problem that I sought to address in this study was why managers of a governmental organization in Ethiopia ultimately chose to trust and adopt cloud computing for e-government services, despite their initial uncertainty or misgivings regarding security and privacy.

Purpose of the Study

The purpose of this study was to provide a deeper understanding of how a governmental organization in Ethiopia overcame the factors that adversely influenced managers of other organizations to the extent that they distrusted and decided against adopting cloud computing for e-government services. The intention in using a qualitative research methodology was to conduct an in-depth single case study, using subjective information and describing a complex phenomenon while providing specific information about the case (Rahman, 2017). When it comes to adopting new technology or processes, the CIOs, managers, and other organizational members of staff were confronted with severely challenging issues and decisions. Even though traditional forms of ICT had undoubtedly made significant contributions to the development of sub-Saharan Africa, the potential ramifications and impacts of cloud computing on governmental organizations in sub-Saharan Africa were unclear (Seifu, Dahiru, Bass, & Allison, 2017). The results of this study may benefit the managers of similar governmental organizations; the adoption models identified could help them to understand the methods by which they can learn to trust and decide to implement e-government services that cost-effectively use cloud computing.

Although there were both negative and positive aspects to consider in relation to the possible introduction of any new technology, the consensus that was reached by previous researchers seems to indicate that by implementing cloud computing, the positive impacts outweigh the negative repercussions. By reducing costs and seamlessly managing the implementation, managers can then focus on their customers and deliver

multiple services by offering single window access to the governmental portal system (Oliveria, Thomas, & Espadanal, 2014). As well as improving government services, the managers at governmental organizations could generate job opportunities in local communities that, ultimately, could lead to positive social change.

Another potential benefit of this study is the opportunity that it creates for service providers to use environmentally-friendly and energy-efficient technologies at central facilities as opposed to having to rely upon separate data centers at each organizational location (Liu, 2015). By overcoming their lack of both confidence and trust in cloud computing, organizations that adopt cloud computing could start saving on their operational costs which, in the long-term, would have the effect of increasing government services and reducing environmental impacts and carbon footprints because of reduced energy use. By presenting the results of this study, I hope to shed more light on these issues.

Research Questions

The overarching general research question (RQ) that drove this study was:

RQ: How had a governmental organization in Ethiopia overcome the factors that adversely influenced managers of other organizations to the extent that they distrusted and decided against adopting cloud computing for e-government services?

The following research subquestions were intended to inform the answers to the general research question by considering managers who already trusted cloud computing and

supported the implementation of e-government services in Ethiopia. The research subquestions (RSQ) were:

RSQ1: What negative factors had influenced the managers of a governmental organization in Ethiopia to distrust cloud computing for e-government services?

RSQ2: How had the managers of a governmental organization in Ethiopia dealt with both positive and negative key factors in terms of keeping the organization's information safe, especially their critical information?

Conceptual Framework

The concept of cloud computing transformed the ideas and applications of ICT services; namely, it shaped the ICT infrastructure solutions that governmental organizations trust to facilitate their operations (Garad, Suyoto, & Santoso, 2017). Based on the research questions that I devised for this study, the key concepts of this project were trust, cloud computing, ICT infrastructure, e-government services, and government. Trust is a psychological state that is determined by a person's ability or intention to make themselves vulnerable due to their positive expectations of the intentions or behaviors of another person or group of people (Pearson & Benameur, 2010). A key objective of organizations in the modern, innovative technological era in which we live is to encourage customers to trust their services by increasing awareness, and ensuring the safety, of their systems. Cloud computing is an emerging technology that is growing at a rate at which it could quickly replace the traditional ICT system. Cloud computing transformed from being a novel technology into one that replaced traditional computing; now, it has become a mainstream ICT strategy.

As a new phenomenon, cloud computing provides access to a pool of computing resources by affording on-demand internet access and requiring minimal management effort on the part of the high-level managers and users (Steinbaner, Khalil, & Kotsis, 2014). The term *e-government* defined as being the new version of *e-commerce* and is used by governments to provide broader electronic services. ICT also used to ensure the provision of effective and efficient services for customers, private businesses, and other governmental organizations (Chipeta, 2018). Governments are adopting to new systems to secure better, faster and more reliable access to government services electronically through devices such as laptops, desktop computers, mobiles, and other handheld smart devices, forms of technology that may be more seamlessly integrated into customers' daily lives (Kumar, Sachan, & Mukherjee, 2017).

Several theoretical frameworks have been used to explore new technology such as the adoption of cloud computing in the context of research into ICT systems. For this research, I used the technology-organization-environment (TOE) framework (Tornatzky & Fleischer, 1990) and the diffusion of innovation (DOI) theory (Rogers, 1995) to examine the new technology acceptance process. Oliveira et al. (2014) suggested that, when seeking to understand better the phenomenon of cloud computing adoption, the use of more than one theoretical and conceptual framework enhances the credibility of the study. The primary mechanisms that characterize the TOE were the features of technology, organization readiness, and the environmental conditions of a governmental organization that drive the adoption of cloud computing for e-government services (Schniederjans & Yadav, 2013). In this study, the main objective in using the TOE

framework was to identify the technological, organizational, and environmental views that influence the managers of a governmental organization to decide to trust and adopt cloud computing for e-government services in Ethiopia. In seeking to understand these views, I gained a deeper understanding of how a governmental organization in Ethiopia overcame the negative factors that typically prevent managers from trusting and adopting cloud computing for e-government services.

I used the DOI and TOE frameworks as analytical tools with which I explained the adoption of cloud computing by a governmental organization. To understand the adoption of several new ICT systems, many researchers used the TOE framework in their studies, which involved enterprise resource planning, electronic data interchange, e-commerce, and blockchain adoption. Recently, some studies used the TOE framework to investigate the adoption of cloud computing (Borgman, Bahli, Heier, & Schewski, 2013). I used the TOE conceptual framework to ground this qualitative single case study by using common themes such as relative advantage, compatibility, complexity, and observability to structure the literature review. To apply the TOE conceptual framework to this research, I mapped the e-government services strategies onto the contextual factors of technology, organization, and the environment.

To attempt to understand how a governmental organization in Ethiopia overcame the factors that had adversely influenced managers to the extent that they distrusted and decided against adopting cloud computing, it was vital to understand the three-dimensional levels such as the user level, the organizational level, and the innovation/market level of the adoption process (Dearing & Cox, 2018). I used the DOI

theory in this study to understand *how*, *why*, and at *what* rate the idea to adopt cloud computing for e-government services spread across social systems. The DOI theory is about recording the creation of the innovation until its conclusion, as well as the speed at which the notion of adopting cloud computing diffused across society, and leading to the adoption of the system by multiple users. Therefore, I used a combined framework and theory that served as a solid base upon which I developed an integrative model.

Nature of the Study

A qualitative research methodology helps a researcher to understand participants' phenomena, experiences, perspectives, and decision-making abilities (Kaczynski, Salmona, & Smith, 2014). The methodology of this study was qualitative in nature; I used a holistic approach to a single case study that illuminated how a governmental organization in Ethiopia overcame the factors that adversely influenced managers of other organizations to the extent that they distrusted and decided against adopting cloud computing for e-government services. To gain a better understanding of complex phenomena and human experiences, Marshall and Rossman (2015) noted that using a qualitative research methodology is better than relying upon quantitative research methods. In the context of a qualitative research methodology, there are five different design choices: a case study, narrative, grounded theory, ethnography, and phenomenology. Leedy and Ormrod (2015) identified that in situations in which researchers are attempting to answer *how* and *why* questions, a case study is often the best approach to adopt in order to understand contemporary phenomena as well as situations

in which the researcher has little or no control over behavioral events such as their strategies and how they implement them.

For this study, a single case study design was the appropriate design to use for the purposes of understanding how governmental organizations in Ethiopia overcame the negative factors that influenced managers to the extent that they distrusted and decided against adopting cloud computing for e-government services. The governmental organization that participated in this study is located in Addis Ababa, Ethiopia. The country was of particular interest to me for this study for the following reason: Ethiopia has the typical characteristics of a newly-developing country in Africa. Consequently, the results of this study could be relevant to other, similarly developing countries. Research in developing countries has been limited to date (Dubey, Gunasekaran, Childe, Wamba, & Papadopoulos, 2016). The population for this study comprises the different levels of a governmental organization's managers who were all involved in the decision-making processes regarding the adoption of cloud computing for e-government services and strategies in Ethiopia. For a qualitative case study, Armbrust et al. (2010) suggested that a quantity of 12 participants should be enough to obtain quality data and to understand the case studies that involve work-related situations.

To identify the participants from a targeted population, I used a purposeful nonprobabilistic sampling technique and identified 12 participants who helped me to reach data saturation. I took the sample from a governmental organization in Ethiopia to conduct semistructured interviews and semistructured observations and to collect the organization's documents for triangulation. Friedrich-Baasner, Fischer, and Winkelmann

(2018) proposed that semistructured interviews, semistructured observation, and analyses of project documents could be effective methods by which a researcher might obtain high-quality data that matches the coding scheme, generated by using existing environments or factors, and examining any effects that are currently unknown. To answer the research questions, I analyzed the data from interview scripts, the notes from the semistructured observations, and organizational documents by using a combination of multiple schemes such as categorizing or grouping (Yin, 2018). For this study, I used Yin's (2018) recommended steps that were (a) starting by reading through all the data, (b) compiling and organizing the data for analysis, (c) beginning a detailed analysis, using a coding scheme, by disassembling the compiled data into fragments, (d) reassembling the data into a sequence of themes or groups, (e) interpreting, and (f) developing a meaningful dataset.

Operational Definitions

The following were the brief operational definitions of the most common terminology that I used in this study, such as cloud computing, cloud computing adoption, trust, e-government services, governmental organization, ICT, and other words and phrases.

Cloud: From an ICT network perspective, a cloud is defined as being a metaphor that is often represented by a network diagram to show that a device is connected to the internet; it is a symbol of the provision of internet-based computing services (El-Gazzar, 2014).

Cloud computing adoption: Cloud computing adoption is a process or strategy that is used by governmental and private organization managers to mitigate risk, gauge the scalability of a database's capabilities, and reduce costs (Abubakar, Bass, & Allison, 2014).

Cloud computing: Though the existing ICT academic literature provides several definitions of *cloud computing* (Sultan, 2014), most researchers commonly refer to the definition that is given by the National Institute of Standards and Technology (NIST). The NIST Experts defined cloud computing as being a model through which we may provide universal, on-demand network access to a shared pool of computing resources; information can be delivered and released with minimal levels of interaction or effort being required from either the service provider or the management staff (Simmon, 2018).

Cloud service provider: Firms that provide computing services to end-users, and own and manage software, computer hardware, networks, and storage (Garrison et al., 2012).

Developing countries: The United Nations Department of Economic and Social Affairs (UNDESA, 2016) classified all countries in the world into three broad categories: (a) developed countries, (b) countries in transition, and (c) developing countries. It also defined developing countries as those that have a less developed industrial base; they score poorly, with a low human development index, compared to developed countries.

E-government (electronic government): The term *e-government* is defined as being the new version of *e-commerce*; it refers to a system that is used by governments to provide electronic services. ICT is used to ensure the provision of effective and efficient

services for customers, private businesses, and other governmental organizations (Chipeta, 2018). The United Nations defined e-government as being a tool by which governmental organizations may transform their internal and external business applications through the use of ICT (UNDESA, 2016).

Information and communication technology (ICT): ICT can be defined as (a) a technological means of collecting (inputting or gathering), (b) collating (processing or analyzing), and (c) conveying (outputting or transferring) information through the use of technology (Afolabi, 2015). The term ICT includes all communication devices, including television, satellite systems, radio, smartphones, computers, hardware, and software, as well as several applications and services that are often associated with them.

Assumptions

Assumptions are the facts that are indicated to be true by researchers but cannot be verified as being true (Yin, 2018). In this study, I assumed that the managers from a governmental organization in Ethiopia would respond to the interview questions both truthfully and impartially. Furthermore, I assumed that the selected participants for this study would be forthcoming and honest with their information about the development of, research into, and application of e-governments and the use of cloud computing as the preferred form of technology at their respective organizations. I assumed that, by conducting this study, I would collect relevant data from the participants' responses, semistructured observations of the teams and the cloud environments, and appropriate documents such as project documents, meeting notes, annual reports, and media. In this study, another of the critical assumptions was that the selection of a qualitative

methodology would enable me to gain insights regarding the nature of the adoption of cloud computing for use in the context of e-government services. Based on the results of this study, I developed new concepts or theoretical perspectives about the adoption of cloud computing and unveiled the problems that jeopardize managers' decisions to adopt cloud computing for e-government services at their organizations.

Scope and Delimitations

The ultimate purpose of delimitations is to define the boundaries and scope of a study. Yin (2014) defined delimitation as a tool to identify the boundaries of a research study. The delimitations of this qualitative study included (a) the geographic boundaries of developing countries, (b) the scope of the study was restricted by focusing only on a single governmental organization, (c) the governmental organization selected for the single case study, (d) the scope of this study included the managers' intent to trust and adopt cloud computing for e-government services but not the implementation of the cloud computing itself, and (e) the negative factors that contributed to the lack of trust in cloud computing adoption for e-government services. The selected participants for this study were limited to managers and decision-makers who had a role in their organization that allowed them to impact the cloud adoption decision-making process. In this study, I took a screening measure to ensure that the research participants met the above delimiting characteristic.

Limitations

Yin (2014) defined limitation as being that which the researcher cannot control. By understanding the limitation of this study, I factored any potential design and

methodological weaknesses into the plans, including the limitations of the dependability and transferability of this study. In any qualitative research design, transferability cannot be assured (Merriam & Tisdell, 2016). The system model that was generated by this qualitative study was not considered as having been validated unless subsequent follow-up quantitative research had taken place to validate the output of the project. Even though the results of this study ensured the applicability of the system model to a governmental organization that had participated in this study, I determined the characteristics of the selection process in such a way that the system model could be applied to as broad a range of organizations as possible. The possibility of failing to capture all the factors that influence managers, in terms of trying to ascertain whether or not particular organizations who were outside of the study sample would trust and adopt cloud computing for e-government services, remains a limitation.

Since the study was conducted in a developing country, Ethiopia, the cultural, economic, and political differences represented another limitation of the study. The selected participants depended on either their opinions or their personal experiences in a specific organizational structure that caused to capture biased information that cannot be generalized to the wider context of the broader population. As the researcher in this study, I could not avoided bias entirely; however, I attempted to reduce the possibility of bias impacting the results and identified the potential sources of bias when critically assessing both the findings and the overall conclusions (Smith & Nobel, 2014). To this end, I briefed the participants at the outset of the study about the importance of providing credible and dependable information regarding how a governmental organization in

Ethiopia overcame the factors that adversely influenced managers of other organizations to the extent that they distrusted and decided against adopting cloud computing for e-government services.

Significance of the Study

In this study, I addressed the issues regarding the factors that adversely influenced managers of other organizations to the extent that they distrusted and decided against adopting cloud computing for e-government services as well as how a governmental organization in Ethiopia overcame such negative factors to adopt the use of cloud computing. In the literature to date, most of the researchers, such as Seifu et al. (2015), Carcary et al. (2014), and Chou (2015), focused on the challenges and the benefits of cloud computing. However, few researchers, such as Mohammed et al. (2016), investigated cloud computing from the e-government services context. This research addressed the gap in scholarship not only in the context of e-government but also by exploring how a governmental organization in Ethiopia overcame the factors that adversely influenced managers to the extent that they distrusted and decided against adopting cloud computing for e-government services.

In a developing country such as Ethiopia, the ability to develop a robust ICT infrastructure to access computing resources had proven to be a challenge for years (Seifu et al., 2015). In contrast, developed nations are already using cloud computing as a gateway through which they may reach small and large organizations alike without having to make incurring any significant financial costs by using the internet on a fee-for-service basis. Although cloud computing provided the opportunity for smaller-scale

organizations to use technologically-advanced services like their larger counterparts (Senarathna et al., 2018), the technology has not been generally accepted. Since cloud computing is a new, emerging technology, different working definitions of cloud computing proposed by individuals and organizations.

The National Institute of Standards and Technology (NIST) in the USA defined cloud computing as being a model that affords universal, on-demand network access to a shared pool of computing resources; information can be delivered and released in such a way that it required minimal interaction and effort on the part of service providers or management staff (Simmon, 2018). Through this study, I provided valuable insights and information to cloud service providers (CSPs) and users. I also contributed to the existing body of scholarship by examining the factors that adversely influenced managers of other organizations to the extent that they distrusted and decided against adopting cloud computing in the form of a trusted cloud computing system model. Aside from making the abovementioned significant contributions, by undertaking this study, I identified, investigated, and analyzed the main drivers and significant negative factors that impede the decisions to accept and adopt cloud computing by managers. The managers were the primary users of the system, so it was essential to understand their willingness, attitudes, beliefs, and behaviors towards using and accepting cloud computing systems (Zayyad & Toycan, 2018). The contributions that this research offers could benefit both CSPs and governmental organizations.

CSPs could use the outcomes of this study to enhance their existing cloud services and to increase their organization's levels of trust in using cloud computing for e-

government services. Thus, managers who work at similar organizations could use the results of this study to adopt cloud-based applications for e-government services and storage solutions to run and store their operational data, based on a newly-established higher level of trust and confidence in cloud computing. In addition to the possible significant savings in cost and time, there are other substantial benefits.

Significance to Practice

The most significant part of this study was the opportunity to potentially contribute to the economic growth that was desired by government leaders who seek to automate governmental services to effect positive social change within the population. Through this study, I addressed Ethiopia's key challenges concerning governmental service delivery, which Lixi and Dahan (2014) indicated were related to a lack of interoperability among systems; limited online access; excessive duplication; extreme inefficiencies in service delivery, such as paper-based approaches; an inconsistent identification process that lacks a national ID system; and cash-based services, which result in inefficient processes and improper activities, all of which hinder the development of the socio-economy.

There has, to date, been a gap in the literature as to how to overcome the reluctance of managers at governmental organizations to trust and adopt cloud computing for e-government services in Ethiopia, as well as how a governmental organization in Ethiopia have overcome this lack of trust. The decision to adopt cloud computing for e-government services could improve efficiencies for customers, reduce operating costs, and increase revenues (Khan, 2016). Also, other government organization managers

could use the results of this study to improve their services for customers, reduce their ICT costs, and reach their customers at a local community level.

Significance to Theory

Through this study, I could contribute to the existing body of knowledge by providing a deeper understanding of how a governmental organization in Ethiopia overcame the factors that adversely influenced managers of other organizations to the extent that they distrusted and decided against adopting cloud computing for e-government services as well as by using a combination of the TOE framework and the DOI theory to explain cloud computing adoption processes. For instance, Low et al. (2011) combined the TOE frameworks and DOI theories to seek to understand the determinant factors of cloud computing adoption in high-tech organizations. The potential contribution of this study to the field of ICT encompasses the knowledge that will be available to managers to help them to understand the benefits and risks of adopting cloud computing for e-government services. Perhaps the result of this study could also contribute to the development of ICT technology by minimizing the existing lack of trust in cloud computing adoption and creating awareness of the power of computing virtually with unlimited computing power.

Since cloud computing is considered to be the third uprising of the ICT industry, following that of personal computers and the internet uprising, forecasted that, by 2020, one-third of global data will reside in the cloud (Gartner, 2017). Developing people's understandings of the third revolution of ICT technology, that is to say, cloud computing could help organizations to increase their levels of innovation and to maintain a

competitive advantage when creating economic opportunities and high-skill employment opportunities. The transformation from predominantly local ICT-based computing to a new cloud-based computing uprising helps to reduce waste by considering an adaptive, energy-efficient, and environmentally-friendly system (Balasooriya, Wibowo, & Wells, 2016). The theory and practice elements of this study could, together with the cost savings that would be achieved by adopting cloud computing for e-government services, contribute, both directly and indirectly, to positive social change and environmental sustainability.

Significance to Social Change

The results of this study include information on the benefits of cloud computing as well as details that inform a deeper understanding of how a governmental organization in Ethiopia overcame the negative factors that typically influence managers to the extent that they distrusted and were unwilling to take risks regarding the adopting cloud computing for e-government services. Such information could lead to significant improvements in integrated government services to customers and, ultimately, lead to positive social change, especially in Ethiopia. This study could align with the commitment of the Office of Research Integrity and Compliance to stimulate positive social change by encouraging the development of customers, communities, organizations, and society at large (DuBois, 2014). The managers are the primary users of the system. It is essential to understand managers' willingness, attitudes, beliefs, and behaviors towards using and accepting a cloud computing system (Zayyad & Toycan, 2018). The results of this study could also help private organizations who plan to adopt cloud computing for

automating their business processes and delivering fast, reliable, and cost-effective products and services, not only to the citizens of Ethiopia but also to citizens in other developing countries. An additional benefit of this study that could lead to positive social change is that of helping to save the environment by discouraging the use of local polluting hardware by, instead, promoting the adoption of cloud computing for organizations' e-government services.

Summary and Transition

In Chapter 1, I discussed the rationale behind this study about the strategies of how a governmental organization in Ethiopia overcame the factors that adversely influenced managers of other organizations to the extent that they tend to distrusted and decided against adopting cloud computing for e-government services. Even though the current literature to the date indicated that there had been intensive research on the topic of cloud computing, there had, in fact, been a gap in the literature that I addressed by investigating how a governmental organization in Ethiopia overcame the factors that adversely influenced managers of other organizations to such an extent that they distrusted and decided against adopting cloud computing in the context of e-government services. Even though computer users noticed the evolution of cloud computing and acknowledged its potential interest to a global audience, many of the governmental organization managers in Ethiopia were reluctant to trust and adopt cloud computing for e-government. To provide a deeper understanding of how a governmental organization in Ethiopia overcame the factors that adversely influenced managers of other organizations to the extent that they distrusted and decided against adopting cloud computing for e-

government services, I proposed a qualitative single case study on a governmental organization in Ethiopia that used a holistic methodology, based on TOE conceptual frameworks and DOI theory.

In Chapter 2, I present a detailed literature review of cloud computing and e-government services, starting with literature search strategies and an integrated theoretical and conceptual framework. In ICT systems research, several theories used to explore the adoption of new technology. In Chapter 2, I also present the theory DOI and the technological-organizational-environmental (TOE) framework. Then, I summarize several kinds of literature in cloud computing, e-government services, cloud computing in the context of e-government, and cloud computing in Ethiopia.

Chapter 2: Literature Review

A literature review is a systematic way in which a researcher may compile and evaluate earlier work to provide a valuable foundation for a problem statement such as that which I defined in Chapter 1. The general research problem was how to overcome factors that cause most of the managers at governmental organizations in developing countries such as Ethiopia to be reluctant to trust and adopt cloud computing for e-government services, especially given that some managers of a governmental organization overcame this lack of trust. The specific research problem that I sought to address in this study was why managers of a governmental organization in Ethiopia ultimately chose to trust and adopt cloud computing for e-government services, despite their initial uncertainty or misgivings regarding security and privacy. Based on the literature review that I conducted for this study, the result of using cloud computing for e-government services was mixed. For instance, Pedersen (2017) compiled several kinds of literature on e-government services and found out that most of the e-government projects that use traditional ICT infrastructure have a slight impact on productivity, lack inter-organizational capabilities, and lack benefits realizations across organizational units.

The literature review for this study involved an investigation of the governmental organizations' managers concerns about the lack of a unified definition by cloud service providers and different perceptions of cloud computing, including the challenges and related benefits (Raut, Privadarshinee, Jha, Gardas, & Kamble, 2018). Therefore, in this section, I present the major controversies and identify a gap in the literature, providing

advanced knowledge, presenting theory development, and displaying areas where more research is needed in the cloud computing adoption process for e-government services.

In this section, I fulfill the ancillary objective of this qualitative single case study to review the literature on the factors that contribute to a lack of trust in cloud computing adoption for e-government services. After the introduction, I present the outline of the literature review and the search strategies, including the theoretical and conceptual framework selected for this study, the existing published literature reviews, and several topics of cloud computing and e-government services. I conclude Chapter 2 with a summary and transition to Chapter 3.

Literature Search Strategy

The literature search strategy for this study involved the use of two major academic online database search engines, (a) business and management databases, and (b) information systems and technology databases. Under those two categories, I searched for the literature related to the problem defined in Chapter 1 using the following databases: ABI/INFORM Collection, Emerald Insight, SAGE Journals, EBSCO, JSTOR, ProQuestCentral, ProQuest Dissertations and Theses, Google Scholar, and Emerald Management Journals. In this study, the overarching general research question that drove this study was:

> RQ: How had a governmental organization in Ethiopia overcome the factors that adversely influenced managers of other organizations to the extent that they distrusted and decided against adopting cloud computing for e-government services?

Therefore, the keywords to explore this question included the following: *(a) cloud computing, (b) cloud computing adoption, (c) trust in cloud computing, (d) trust in cloud computing adoptions, (e) e-government services, (f) new technology adoption, (g) cloud computing for e-government services, (h) qualitative studies in cloud computing, (i) qualitative studies in new technology adoptions, (j) qualitative studies in ERP systems, (k) cloud adoption in government, (l) cloud adoption in developing country, (m) technology-organization-environment (TOE) framework, (n) diffusion innovation (DOI) theory, and (o) single case study.* The goal of this qualitative single case study was to provide a deeper understanding of how a governmental organization in Ethiopia overcame the factors that adversely influenced managers of other organizations to the extent that they distrusted and decided against adopting cloud computing for e-government services. To identify germane scholarship, I focused the literature review on the conceptual framework, e-government services, cloud computing, and cloud computing adoption.

Conceptual Framework

Based on this study's research questions, the key concepts of this study were trust, cloud computing, ICT infrastructure, e-government services, and governmental organization. Trust is a psychological state involving the intention to accept vulnerability based upon positive expectations of the intentions or behavior of another (Pearson & Benameur, 2010). Pearson and Benameur (2010) also discussed the definition of trust from psychology, sociology, and computer science perspectives and described different facets of trust: calculative, relational, emotional, cognitive, institutional, and

dispositional. The objective of the modern and innovative technological era in which we live is to make customers trust the cloud services by providing awareness and ensuring the safety of the system. Cloud computing is an emerging technology that is growing at a rate at which it could quickly replace the traditional ICT system.

Based on the NIST SP 800-145 document, the definition of cloud computing is "a model for enabling ubiquitous, convenient, on-demand network access to a shared pool of configurable computing resources (e.g., networks, servers, storage, applications, and services) that can be rapidly provisioned and released with minimal management effort or service provider interaction" (Simmon, 2018, p. 2). As an emerging phenomenon, cloud computing draws attention from governmental and private organizations as more businesses are moving their activities to the cloud. Cloud services are becoming more prevalent due to various advantages, such as optimal resource utilization, greater flexibility, cost reduction, and elasticity. It also offers multiple usages, such as big data analytics, disaster recovery and backup, file storage, and test and development (Ferkoun, 2014).

E-government is a means of communication for governments to interact with their customers, other governmental domain, private sectors, taxpayers, and other entities that need effective and efficient services from a government. The United Nations defined e-government as a tool for governmental organizations to transform their internal and external business applications using ICT (UNDESA, 2016). E-government is used as a tool to enhance the concept of governance, which results in the transparency of governmental functions by the customers participating in the system electronically and in

turn results in higher governmental service efficiency (Ojo, 2014). Governments are moving to a new concept for better, faster and reliable access to government services electronically through electronic devices, such as laptops, desktop computers, mobiles, and other handheld smart devices, which are more seamlessly integrated into customers' daily lives (Kumar et al, 2017).

In ICT systems research, several theories have been used to explore new technology adoption. These theories include (a) TOE model (Tornatzky & Fleischer, 1990); (b) DOI (Rogers, 1995); and (c) technology acceptance model (TAM; Davis et al., 1989) with the unified theory of acceptance and the use of technology (UTAUT) model (Venkatesh & Davis, 2000). For this study, I included only the TOE framework and DOI theory to conceptualize the cloud computing adoption for e-government services. Tornatzky and Fleischer (1990) described the TOE model as a process of technological innovation with the features of technology, organizational readiness, and the environmental condition of an organization that drives the adoption of new technologies (innovation). The DOI theory conceptualized the TOE framework. The DOI theory encompasses technology property, internal organizational elements, and external organizational factors, all of which condense the theory and make it well-suited to the TOE framework (Rogers, 2003). Because the DOI theory conceptualizes the framework, the TOE framework was also used to ground this study and evaluate the three contextual aspects that influence the adoption of cloud computing for e-government services.

Several other researchers also asserted that the TOE model provides an excellent theoretical foundation with wich to explore information system adoption behavior in the

context of governmental organizations. For instance, Chiu, Chen, and Chen (2017) employed the TOE framework to conduct their study of the adoption of broadband mobile applications by organizations in Taiwan. Likewise, Awa, Ukoha, and Emecheta (2016) used the TOE framework when they studied the adoption of ERP solutions in Nigeria organizations. Ramdani, Kawalek, and Lorenzo (2009) made use of the TOE framework to try to predict which enterprises would potentially adopt such systems in English organizations.

On the basis of the empirical evidence that I have detailed above, the TOE framework offered an appropriate theoretical foundation for this study, one from which I could investigate why the managers of a governmental organization in Ethiopia ultimately chose to trust and to adopt cloud computing for e-government services, despite their initial uncertainty or misgivings regarding security and privacy. The TOE framework proved to be invaluable to this study in helping to examine the impact and influence of negative factors on individuals' decisions regarding cloud adoption. In contrast to other theories that are commonly used for explaining decisions concerning innovation adoption, the TOE framework helped this study not only by supporting the exploration of the technological aspects, but also and more importantly, by enabling this study to involve the organizational and environmental contexts of such decisions. Hence, in this study, I provided valuable insights through the comprehensive analysis of the various aspects that must be considered by upper managers when deciding whether to adopt cloud computing. In considering the technological, organizational, and

environmental contexts of this study, I drew upon DOI theory, which renders the results of this study more robust.

I used the DOI theory to address the innovation/market levels of technological innovation while considering the limitations of incorporating the environmental perspective (Raut et al., 2018). The DOI theory was established for the purposes of understanding how, over time, a new technological idea gains momentum and spreads (diffuses) through a specific social system. Based on this theory, customers adopt new technology as a result of the diffusion process. In the context of this study, managers and decision-makers are the potential adopters, and cloud computing is the innovation available for e-government services. Dearing and Cox (2018) indicated that there are five adopter categories: innovators, early adopters, early majority, late majority, and laggards. This study used all five adopter categories to determine the characteristics of adopters (organizations), perception of opinion leaders' reaction or social influence, and the larger political and social context that framed the meaning of the innovation as well as the timing of its introduction. With a combination of two or more contexts and a more comprehensive research framework, this study reduced some of the limitations of a single framework. In general, both social and technical aspects are expected to be the right move to the sociotechnical environments of cloud computing adoptions. This study used the above system models to address the issues and minimized the limitations, starting with the TOE conceptual framework.

Technology-Organization-Environment Conceptual Framework

The TOE framework was used by several researchers to ground technology adoption studies (Jia, Guo, & Barnes, 2017; Kinuthia, 2015; Ruivo, Oliveira, & Neto, 2014). A review of scholarly literature demonstrates that the organizational-level theory has three different elements to influence cloud computing adoption decisions (a) the technological context, (b) the organizational context, and (c) the environmental context, all of which differ for each study. The tendency that differs for each study is that the TOE framework does not provide information on what specific elements organizations need to explore (Jia et al., 2017). The other advantage of using the TOE framework was the ability to apply the framework in any organizations such as governmental organizations. Since the framework lacks specificity, the TOE can apply to several studies (Wang & Lo, 2016).

In this study, I synthesized the elements from the technological context, organizational context, and environmental context. The elements of the TOE framework are required to be studied before the decision is made to adopt cloud computing for e-government services (Chau & Tam, 1997). All three factors (technology, organization, and environmental conditions) were the driver of the cloud computing adoption process. Chau and Tam (1997) noted that three contexts influence the adoption of cloud computing: (a) technological, (b) organizational, and (c) environmental. Each element from all three contexts was presented in this study, starting with the technological context.

Technology-Organization-Environment: Technology Context

The technological context involves both the technologies that are already in place in the organizations and the technologies that are created, developed, and marketed but not yet deployed in the organization. The TOE conceptual framework, from the context of the technological factors, includes elements such as (a) ICT infrastructure, (b) relative advantage, (c) compatibility, (d) security concerns, (e) complexity, (f) efficiency, (g) competencies, and (h) cost savings (Ismaili, 2016; Kinuthia, 2015; Beheshti et al., 2014; Ruivo et al., 2014). The first element of the TOE framework to be considered in a technological context was ICT infrastructure.

ICT infrastructure. One of the TOE framework elements was ICT infrastructure. Cloud computing adoption for e-government services could force the replacement of the existing or old ICT infrastructure that may hinder cultural issues, such as the reorganization of the organizational hierarchy (Beheshti et al., 2014). The restructuring of ICT infrastructure could result in creating new departments that may affect ICT experts' performance in their roles. As a result, the ICT infrastructure was a critical success factor that must be considered in the adoption of cloud computing for e-government services.

Relative advantage. The second part of the TOE framework elements was a relative advantage. Relative advantage comprises the advantages of the new technologies outstanding the existing technology. Since relative advantage was one of the TOE framework technology elements, Yoon and George (2013) suggested that organizations prefer new technology that adopters perceive as superior. The adoption of new technologies has no relationship with a relative advantage. Professional and academic

kinds of literature support the concept of relative advantage (Kinuthia, 2015). Managers of any organization should ensure that the relative advantage of the new technologies was compatible with the organizational culture.

In several studies, some researchers indicated that governmental organizations that adopted cloud computing have a higher relative advantage than those who implemented traditional ICT systems for e-government services (Gangwar et al., 2015; Johnson, 2015). This factor is crucial because it is directly linked with the benefits that new technologies could bring for governmental organizations to provide easier, faster, and more efficient services to customers. The managers and decisionmakers of governmental organizations should ensure the relative advantage of the cloud computing adoption was compatible with the organization.

Compatibility. The third TOE framework technology element was compatibility. Rogers (2003) defined compatibility as to how consistent the new technology is with the existing technology. Managers of the governmental organizations should establish harmony between the software and hardware and enhance the current e-government services to fully integrated and effective governmental services to their customers. Kinuthia (2015) argued that managers of governmental organizations are more likely to adopt new technologies that are compatible with their organizational structure and culture.

In some cases, the decision to adopt new technologies was directly affected by the compatibility of new technology with the existing systems. Managers of governmental organizations who adopt cloud computing for e-government services have a higher level

of technology compatibility within their organization than those who used traditional ICT infrastructure to implement e-government services (Yoon & George, 2013). Managers should take high level security measures to protect their organizations' compatible technical environment.

Security and privacy concerns. The fourth part of the TOE framework elements was security concerns. Taking data outside an organization's premises and sharing them with a multitenant environment creates security concerns and leaves organizations with potential threats (Schneiderman, 2011; Shen & Tong, 2010). For instance, early adopters of cloud computing for e-government services have viewed data transmission as an organizational security vulnerability. Several studies, such as those by Zissis and Lekkas (2012), Wang (2010), and Dutta et al. (2013), have indicated that several operational and technical issues can affect decisions as to whether or not to trust cloud services, and these concerns include risks, privacy, security, and information loss.

Among several concerns, privacy was one of the critical obstacles to the adoption of cloud computing for e-government services. Ziyad and Rehman (2014) investigated that the lead hindrance in the process of trusting and adopting cloud computing services was posed by both data security and privacy concerns. All these issues affect governmental organizations' managers directly for making decisions regarding the adoption of cloud computing for e-government services. In this study, one of the major objectives was to provide a deeper understanding of how a governmental organization in Ethiopia overcame the factors that adversely influenced managers of other organizations to the extent that they distrusted and decided against adopting cloud computing for e-

government services. New technologies such as cloud computing have a level of complexity that required the attention of managers.

Complexity. The fifth TOE framework technology element was complexity. One of the critical success factors for cloud computing adoption was complexity (Yeh & Walter, 2016). Customers are encouraged to develop their computing skills through new cloud computing services. The first step in adopting new technology is understanding the complexity of the innovation and how quickly the users can become knowledgeable of the cloud computing systems (Ruivo et al., 2014). The managers of governmental organizations and their customers could become anxious and discouraged by the complex cloud computing system. Ruivo et al. (2014) argued that the perceived complexity of new technologies could discourage managers from trusting cloud computing adoption for e-government services.

Efficiency. The sixth TOE framework technology element was efficiency. In developed countries and governmental organizations, cloud computing is helping to improve efficiency in their services to customers. Awa and Ojiabo (2016) indicated that e-government users use efficiency to run organizational processes with ease and managers whose organizations have a better operational efficiency are more likely to use their e-government systems to deploy complex and compatible ICT infrastructure and to make sure the end user's acceptance requires ICT competencies.

Competence. The seventh TOE framework technology element was competence. Researchers identified three ICT competency levels, including knowledge management systems level, ICT capability level, and capability maturity model (CMM) level of an

organization (Schniederjans & Yadav, 2013). The ICT capabilities are data flow management, data conversion, and system support and testing for technology, all of which contribute to e-government services. The knowledge management systems aspect of ICT competency factors is a relative advantage and source of compatibility with legacy systems. Awa and Ojiabo (2016) indicated that governmental organizations with highly skilled workers are more likely to adopt cloud computing for e-government services. The CMM level of an organization is crucial to e-government services. Having a technologically advanced system has a significant influence on trust and the likelihood of managers adopting cloud computing for e-government services (Adejare, Shahzad, & Hassan, 2018). Cost is one of the decision factors that affect the adoption of cloud computing services.

Cost savings. The eighth part of the TOE framework elements was cost savings. In any economic field, cost plays a critical role in adopting new technologies. Cervone (2010) indicated that cloud computing provides an opportunity for reducing costs in the areas of ICT investment, innovation, and minimizing the total cost of computing resources. Users may perceive or compare the total cost of using cloud computing to local based ICT infrastructures. The concept of cloud computing enables several cost saving benefits by reducing infrastructure costs, rates of data center energy consumption, and maintenance costs (Marston et al., 2011). As a result, these cost-effective methods can help governmental organizations with new opportunities in offering effective and efficient e-government services to their customers more innovatively. These cost-effective benefits could apply to cloud computing services as well.

Technology-Organization-Environment: Organization Context

The organizational context associated with the resources and characteristics of the organizations includes structural links among employees, intraorganization communication systems or processes, the size of the organizations, and the capacity of slack resources. Studies indicated that there are different ways the organizational context impacts the new technology adoption and implementation process. The organizational TOE framework elements are organizational size, organizational scope, centralization, formalization, organizational readiness, top management support, project management, and best practice (Jia et al., 2017, Kinuthia, 2015; Ruivo et al., 2014; Schniederjans & Yadav, 2013; Yoon & George, 2013). Based on the above list, the size of an organization is one of many facets that can affect decisions as to whether to adopt new technology.

Organizational size. The first TOE framework organizational element was the organizational size. Tornatzky and Fleischer (1990) argued that organizations with larger resources have a greater chance of adopting new technologies faster as compared to mid- to small-sized organizations. Several studies support the idea that the size of the organization has a direct relationship with technology adoption (Kinuthia, 2015; Tornatzky & Fleischer, 1990; Yoon & George, 2013). In most cases, smaller organizations with financial constraints could become late adopters of innovation. To improve the performance of midsize organizations, Adejare et al. (2018) argued that the organizational size and structure has a significant influence on the adoption of new technologies. In some cases, smaller organizations are more susceptible to adopting new technologies faster than large organizations. Kinuthia (2015) contended that small

organizations tend to adopt cloud computing faster than large organizations because large organizations may already invest the ICT resources than smaller organizations, and larger organizations tend to control their mission critical systems inhouse. An organizational scope and its size are complementary factors; hence, the smaller the organization, the smaller the scope.

Organizational scope. The second TOE framework organizational element was an organizational scope. From the TOE framework perspective, Jia et al. (2017) studied the adoption of new technologies and noted that the scope of an organization is the internal coordination and communication of activities. Yoon and George (2013) indicated that organizations have significantly decreased the ICT cost of coordination and communication with the advent of cloud services. Managers tend to have offices across multiple geographical locations, which created a unique challenge of sharing best practices and knowledge. Yoon and George (2013) also argued that the wider the scope of the organization, the more likely that managers would trust cloud computing adoption. Governmental organizations with lower levels of formalization have a better chance to adopt new technology than an organization with a higher level of formalization.

Formalization. The third TOE framework organizational element was formalization. As compared to smaller organizations, large organizations that have a nationwide or global presence have more often formalized internal communications. Kinuthia (2015) postulated that the organizations with a low-level formalization and with a smaller scope are more likely to adopt new technologies such as cloud computing than organizations that have higher levels of formalization and a wider scope. The reason

behind that was the larger organizations with a higher level of formalization tend to have a complex horizontal structure, including multiple offices and branches. Kinuthia (2015) also noted that organizations with a lower level of formalization tend to encourage their employees to be more innovative than organizations with higher levels of formalization as this could inadvertently hinder employee's innovation. As a result, larger organizations with higher levels of formalization have a centralized authority.

Centralized. The fourth TOE framework organizational element that concentrates the authority of decision making was centralized. Researchers noted that organizational processes or structures might not be affected by centralization (Tornatzky & Fleischer, 1990). Other researchers, such as Kinuthia (2015), Yoon and George (2013), argued that the chance of adopting new technologies, such as cloud computing, exist with lower levels of centralization than higher levels of centralization. From the TOE framework organizational element perspective, centralization and formalization are complimentary, while they also have high levels of formalized organizations and a high level of centralized authority.

Organizational readiness. The fifth TOE framework organizational element was organizational readiness. Managers of governmental organizations need to understand how to adopt and implement highly complex cloud computing processes for e-government services projects. Further, they should also be aware that such operations demand a highly skilled workforce and financial resources. Kinuthia (2015) defined organizational readiness as the ability of an organization to acquire a skilled workforce and financial resources before they engage in a project. Both skilled workforce and

financial resources are predictors of organizational readiness. Financial resources cover the costs of services per application, while project management staff are responsible for deploying the e-government services successfully.

Managers also need to have a skilled workforce to perform tasks, such as identifying the right e-government applications, working with cloud service providers, and training employees on how to use cloud computing to provide e-government services to customers. Kinuthia (2015) posited that organizations that have adopted cloud computing for e-government services have a higher level of organizational readiness than those who use traditional ICT infrastructures to deploy e-government services. The financial resources used for adopting and implementing cloud computing for e-government services came from upper management decisions. In the implementation of e-government services in an organization, the role of senior management is a proposition factor.

Senior management support. The sixth TOE framework organizational element was senior management support. Researchers agreed that senior management support, including managers and executives, influences the adoption of new technologies and directly affects the adoption of cloud computing for e-government services (Schniederjans & Yadav, 2013). An ICT manager in a senior management position is the prime decisionmaker and has the power to minimize the resistance in adopting new technologies such as cloud computing. Senior managers of the organization control the financial resources, skilled workforce, and functional resources. Coeurderoy, Guilmot, and Vas (2014) recommended that senior managers should not focus only on the

components of the system during the adoption of new technologies. Senior managers should allocate project managers who emphasize performance measurement, the effects of team leaders, and their effectiveness.

Project management. The seventh TOE framework organizational element was project management. Project managers help organizations to plan, communicate, and efficiently integrate with their vendors and supply chains, as well as disseminate skills and knowledge across the organizations. Starinsky (2016) noted that to maximize organizational performance, project managers use best practices, such as running a lean operation, collaborating, and improving time to market.

Best practice. The eighth TOE framework organizational element was an example of best practice. Ruivo et al. (2014) defined the best practice as the process of migrating, configuring, and customizing applications delivered by cloud service providers to meet the organizational requirements. To measure the level of configuration, customization, and level of ease of use, managers of organizations use their best practice experiences to meet the organizational requirements. The adoption of best practices by managers is to enhance the process of application setup, documentation, testing, and training. Managers who seek less configuration and customization of new applications on their ICT infrastructure are more likely to adopt cloud computing for e-government services (Ruivo et al., 2014). The successful implementation of e-government services requires best-practice applications to organizational processes and e-government system software and hardware.

Technology-Organization-Environment: Environmental Context

Regarding the environmental context, governmental organizations need to analyze their ability to adopt new technologies using SWOT (strength, weakness, opportunities, and threats) analysis tools (Bull et al., 2016). The third component of the TOE conceptual framework was the environmental factor. Due to the external factor that affects the organization outside their control, the factor of the environment influences the adoption of new technologies. The TOE framework environmental elements include competitive pressure, trust, and external pressure (Awa & Ojiabo, 2016; Jia et al., 2017; Ruivo et al., 2014; Schniederjans & Yadav, 2013; Yoon & George, 2013).

Competitive pressure. The first TOE framework environmental element was competition. Competition is an external factor that organizations need to pay attention to by adopting new technologies to gain a competitive advantage. Jia et al. (2017) noted that organizations that have understood the pressures from rivals are more likely to ensure they stay competitive by deploying new technologies such as cloud computing. Managers of such organizations could succumb to pressure from their competitors, who often have a set goal of the early adoption of new technologies and receive exclusively unnecessary pressure from their stakeholders. Kinuthia (2015) stated that both regulatory policies and pressure are determinant factors of adopting an innovation. Organizations that imitate the action of their rivals due to their concerns that they may be lagging in their industry are more likely to adopt socially enabled new technologies due to the higher mimetic pressure. The higher the coercive pressure from stakeholders, the more likely the

organizations could adopt new technologies. Managers should balance this coercive pressure with trust.

Trust. The second TOE framework environmental element was trust. For obtaining a competitive advantage, trust is a crucial element for organizations. Previous researchers have failed to address trust in e-government services (Schniederjans & Yadav, 2013). Trust is a critical success factor for adopting cloud computing in e-government services. For instance, for governmental organizations to adopt new technology needs system security, a TOE framework technology element, and trust that must exist among users, service providers, and consultants based on goodwill, contractual agreements, and competency (Schniederjans & Yadav, 2013). Contractually, the service providers are required to deliver an organization with all information, including its capabilities and limitations. For managers to make an informed decision, the relationship between the organizations and service providers should be built based on trust. Managers require consultants to carry out their duties based on contracts. Schniederjans and Yadav (2013) hypothesized that based on the three parties, service provider, consultant, and clients, the service provider process, the consultation process, and perceived usefulness positively relate to the success of e-government services.

External pressure. The third TOE framework environmental element was external pressure. Wang and Lo (2016) noted that the external pressure that influences the success of an organization in adopting new technologies includes government entities, customers, and service providers. There is a positive relationship between external pressures, such as regulatory pressure, and the success of adopting cloud computing for

e-government services. When the external pressure is elevating, the chance of organizations adopting new technologies is very high (Wand & Lo, 2016). For instance, based on government regulatory requirements, the implementation of an electric utility system would require the best practices.

The use of the TOE framework as a lens to ground the adoption of cloud computing for e-governments has a limitation in its relationship between the elements of framework and factors, which is loose. The reason behind this looseness was that the elements vary across countries and industries. There are no single proposed adaption models for using cloud computing for e-government services. For instance, the results of a research study by Ruivo et al. (2014) indicated that in a small business in Portugal, the most important elements regarding technology were compatibility, complexity, and efficiency. Unlike Portugal, the most important elements for the USA are relative advantage, compatibility, and security for cloud adoption. A researcher may establish a consistent relationship among TOE framework elements, geographical location, and industry. Awa and Ojiabo (2016) concluded that technical factors have a more significant influence on the decision to adopt innovative technology than organizational and environmental factors.

Diffusion of Innovation Theory

The DOI theory was a well-used theory both in academia and in practice. Rogers (1995) introduced the DOI theory, which he later fine-tuned to highlight the complex context of new technologies or innovations for both interventionist and explanatory purposes. In the same book, he also defined innovation as an idea, findings, or objects

that are considered to be *new* by an individual or other adoption entity. The DOI theory helped the researcher for this study to understand how, why, and at what rate technologies and innovative ideas spread in a social system (Rogers, 1995). Based on the DOI theory, the decision to adopt cloud computing for e-government services can be explored through five innovation characteristics: (a) relative advantage, (b) compatibility, (c) complexity, (d) observability, and (e) trialability. Rogers (1995) suggested that the individual, internal, and external characteristics of the organizational impact cloud computing adoption and implant the adoption of new technology within the context of a social system.

Researchers indicated that support for the use of DOI in cloud computing adoption in the context of e-government services, as well as an organizational operation needs, the computability and complexity of cloud computing technologies, and the indirect benefits, all of which tend to influence governmental organizations in adopting cloud computing (Oliveria et al., 2014; Wu, Cegielski, Hazen, & Hall, 2013; Lin & Chen, 2012). In an era of globalization, organizations need an efficient platform to communicate and exchange information in real-time using virtual offices or by permitting employees to work from their homes. Adopting such technology helps managers to minimize capital and reduce operational expenditures.

Sahin (2006) categorized the entire DOI theory into four major elements: (a) innovation, (b) communication systems, (c) time, and (d) social system. When an individual perceives a new phenomenon as a new idea, new practice, or new object, this is called innovation. When a user shares information about innovation with others, this

creates a channel for communication. Hence, the best way to establish communication in cloud computing adoption, the quicker the diffusion of innovations. The DOI theory records the creation of cloud computing until its conclusion, as well as the speed at which cloud computing is diffused into society and adopted by governmental organization managers. Innovation is useless unless it is accepted by society and provokes positive social change. Tornatzky and Fleischer (1990) proposed a combination of the DOI with the TOE framework to extend the DOI to gain a comprehensive understanding of the key determinants of cloud computing adoption for e-government services.

Combining Technology-Organization-Environment and Diffusion of Innovation

Since the TOE framework is dependable with the DOI theory, many researchers in the ICT field are using a combination of TOE and DOI to explain innovation adoption (Oliveria et al., 2014). The TOE framework incorporates the five diffusions of innovation attributes to influence new technology adoption. One can acknowledge that this is expressly true, bearing in mind the plethora of studies (Albar & Hoque, 2015; Gide & Sandu, 2015; MacLennan & Van Belle, 2014; Low, Chen, & Wu, 2011) that have used both the TOE framework and the DOI theory to enlighten technology adoption.

Furthermore, the combination of both theories also widely used to enlighten cloud computing adoption. For instance, Low et al. (2011) combined the TOE frameworks and DOI theories with understanding the determinant factors of cloud computing adoption in high-tech industries; Gide and Sandu, (2015) used both the TOE and DOI theories to study the key factors influencing cloud-based services adoption for organizations in India; and Albar and Hoque (2015) also presented the determinant factors of cloud

computing adoption for enterprise resource planning in Saudi Arabia. While only a few of the studies focused on the general cloud computing framework, most of the studies focused on cloud computing adoption from a specific industry or country context. Therefore, by deciding to use a combined framework and theoretical approach, I ensured that I had a solid base upon which I could conduct this research into a governmental organization's willingness to trust cloud computing for use in their processes in Ethiopia.

Literature Review

A literature review is a systematic way to synthesize previous work on a specific research topic. To identify major gaps and controversies that a researcher can fill, a literature review delivers a framework for a researcher to develop an overview of the phenomenon (Walker & Solvanson, 2014). The objective of this literature review was to synthesize academic and professional context that addresses the research question: how had a governmental organization in Ethiopia overcome the factors that adversely influenced managers of other organizations to the extent that they distrusted and decided against adopting cloud computing for e-government services? The organization of the literature review was guided by the conceptual framework of TOE model and the DOI theory. The TOE model helps to guide the literature review with the three significant contexts: organizational, technological, and environmental. The literature review was focused in cloud computing adoption for e-government services in developing countries.

During the literature review, the DOI theory was used as a guide to understanding how, over time, a new technological idea gains momentum and spreads (diffuses) through a specific social system such as governmental organizations. With a combination of two

or more contexts and a more comprehensive research framework, this study reduced some of the limitations of a single framework during the literature review. The literature search in cloud computing adoption for e-government services in developing countries started with the definition of cloud computing; the emerging phenomenon of cloud computing; e-government services; e-government challenges in developing countries; e-government technological, human aspects, and social challenges; and cloud computing in the e-government context. The literature review included the current research information, the significance of the results, and gaps in current knowledge.

Cloud Computing Definition

In support of the United States' government's efforts, the National Institute of Standards and Technology (NIST) assumed a mission and leadership role in improving government services and reducing costs with the effective and secure adoption of the cloud computing model. Based on this mission and leading role, NIST developed a road map for cloud computing technology and set cloud computing standards under SP 500-293 NIST Cloud Computing Technology Roadmap, Volume I and II (Badger et al., 2014, p. 40, 98). The NIST roadmap included high-level priority requirements in interoperability, portability, and security for the government's cloud computing adoption. NIST published SP 800-145 back in the fall of 2010 with a clear definition of cloud computing that retained global acceptance. Since that time, Simmon (2018) stated that the cloud computing environment demonstrated a development in technical maturity, yet the evaluation of cloud computing services based on NIST SP 800-145 acknowledges that the NIST definition of cloud computing is still valid.

Based on the NIST SP 800-145 document, the definition of cloud computing is that it is "a model for enabling ubiquitous, convenient, on-demand network access to a shared pool of configurable computing resources (e.g., networks, servers, storage, applications, and services) that can be rapidly provisioned and released with minimal management effort or service provider interaction" (Simmon, 2018, p. 2). The NIST definition adds a supporting concept of five essential characteristics, three service models, and four types of deployment models. The five essential characteristics are (a) on-demand self-service, (b) broad network access, (c) resource pooling, (d) rapid elasticity, and (e) measured service. The three service models are (a) software as a service (SaaS), (b) platform as a service, and (c) infrastructure as a service (Iaas). The four deployment models are (a) governmental, (b) private, (c) community, and (d) hybrid.

Having provided a working definition, together with supporting evidence, it is now essential to identify the key players in cloud computing. Versick and Troger (2014) stated that the key players in cloud computing services are cloud carriers, cloud service providers, cloud auditors, cloud brokers, and cloud users. The new technology of cloud computing creates an opportunity for managers to share a pool of resources for their computing needs through on-demand and ubiquitous networks (West, Battleson, Kim, & Ramesh, 2014).

An Emerging Phenomenon of Cloud Computing

Cloud computing is an emerging technology that is growing at a rate at which it could quickly replace the traditional ICT system. The idea of computing in a cloud environment started back in the 1960s, when John McCarthy governmentally predicted

that “one day, the computer I am using might someday become a utility computer like other utilities, such as the telephone system for governmental service” (Simamora & Sarmedy, 2015, p. 2). Many small business owners started early in adopting cloud computing because it allows them to have access to a more complicated system and professionally manage ICT operations without investing heavily in ICT infrastructure. The system was designed to pay for what they used, like utility bills such as electricity, water, and gas (Durao, Carvalho, Fonseka, & Garcia, 2014). At present, organizations are facing a rapidly changing environment that forces them to seek high-performance computing power that allows them to build, integrate, and reconfigure competencies. Also, most organizations want to position themselves to achieve competitive advantage (West et al., 2014). The new emerging phenomenon of cloud computing offers an alternative to organizations to move from traditional computing with off-the-shelf software to in-house software development with the competence to possess a virtual infrastructure through cloud computing.

Cloud Computing Usage and Growth

Cloud computing transformed from a novel technology into replacing traditional computing, and now, it became a mainstream ICT strategy. As a new phenomenon, cloud computing is providing access to a pool of computing resources through on-demand internet access and with minimal management effort on the part of the managers and users (Steinbaner et al., 2014). As an emerging phenomenon, cloud computing draws attention from governmental and private organizations as more businesses are moving their activities to the cloud. Cloud services are becoming more prevalent due to various

advantages, such as optimal resource utilization, greater flexibility, cost reduction, and elasticity; and multiple usages, such as big data analytics, disaster recovery and backup, file storage, and test and development (Ferkoun, 2014). Unlike the traditional ICT system, managers and ICT professionals can use cloud computing services without owning the infrastructure that provides the services. The organization's procurement department does not have to deal with procuring and managing the needed computing resources to acquire computing capabilities in their in-house data centers (Phaphoom, Wang, Helmer, & Abrahamsson, 2015). An increasing number of governmental and private organizations have recently adopted cloud computing services that are managed and owned by a cloud computing services provider.

From a cost perspective, Reddy, Mudali, and Roy (2017) stated that the use of cloud computing that is managed and owned by service providers allows organizations to take advantage of on-demand services and benefit from the efficient and fast application, low-level maintenance cost, cheaper ICT labor cost, and chargeback capabilities. The result of these cost benefits helps cloud computing services to use the ongoing growth from the organizational spending in acquiring the services. Based on Gartner's ICT infrastructure, operations, and cloud strategies, the analysts presented that the worldwide IaaS cloud services market grew 29.5 percent in 2017, which brings the total market value to $23.5 billion, up from $18.2 billion in 2016 (Gartner, 2018). During 2017, in the IaaS market, owned by Amazon, was the top vendor, followed by Microsoft, Alibaba, Google, and IBM (Gartner, 2018). These figures indicated that the attractiveness of a computing model, as well as the related aptitudes operational and deployment agility at a

lower cost point than most organizations, attempt to achieve from building their infrastructure and associated applications.

In government, there are two top drivers in adopting cloud computing: attaining cost savings and carrying services efficiently. Gartner forecasts double-digit growth in the government's use of cloud computing in the coming years and predicts the growth of spending with to be an average of 17.1 percent per year through 2021 (Van der Meulen, 2018). Gartner also indicates that companies across all industries are spending an average of 20 percent of their ICT budgets in cloud computing. However, the spending from the governmental organizations' expenses regarding cloud computing differ whether they operate at the national level to the state, or from the province level to the local level.

One of Gartner's research directors, Neville Cannon, indicated that the key to successfully implementing cloud computing in government is recognizing the unique regulatory, organizational, technical, and procedural issues of the individual organization. For instance, local and regional governments tend to obtain the immediate tactical benefits of new technologies and cost savings; whereas the national governments characteristically see cloud computing as a long-term solution to modernize their strategies for e-government services. Therefore, the governments need to consider cloud computing for e-government services and to consider it, as some thinkers do, the fifth utility after telephone, electricity, water, and gas (Alsahib, Aldeen, Salleh, & Razzaque, 2015). For instance, one of the cloud computing services as utility is SaaS.

Software as a Service

Based on NIST's service modules, cloud computing services operate in the area of IaaS, SaaS, and platform as a service (Wang, Tianfield, & Mair, 2014). Over the past decade, the development of SaaS created further interest in the management, monitoring, and quality of business applications. Among the small and mid-size firms, SaaS become the most popular cloud computing out of the three service models (Murphy, 2015). The reason behind the popularity of SaaS cloud computing was because users can access applications from multiple devices, such as a thin client, through web-based applications such as web-based email providers or web portals. Instead of running and storing resources locally, cloud computing offers governmental organizations the ability to interact with each other and access SaaS from anywhere over the internet (Zota & Petre, 2014). Therefore, the governmental organizational managers do not have to manage the underlying infrastructure, such as servers, storage, operating systems, networks, or even the individual's capability of the application, except the individual's user-specific setting configuration.

Previous researchers indicated that there was no limit when it comes to the use of SaaS, including governance, human resources, customer relationship management, financial disclosure and report management, organization performance management, and data analysis (Murphy, 2015). The use of SaaS also helped organizations to improve their development and operational performance, as well as moved their applications to mobile devices so they can access their app from anywhere that has internet access. Currently, several developers are developing desktop applications and mobile apps using the cloud

platform. For instance, Walden University used a cloud computing product called Microsoft Office 365, while other organizations used Salesforce CRM products for sales and marketing departments. In such services, the organizational managers do not have to manage or maintain the underlying cloud infrastructure, which includes networks, servers, operating systems, or storage (Salesforce, 2019).

E-Government Services

E-Government

Governments are moving to a new concept for better, faster, and reliable access to government services electronically through electronic devices, such as laptops, desktop computers, mobiles, and other handheld smart devices, which are more seamlessly integrated into customers' daily lives (Kumar et al., 2017). The traditional methods of accessing government services are limited to physical offices, office hours, and spatial dimensions; on the other hand, the use of e-government services allows customers to access government services anywhere and anytime in an area where they have computer devices and internet access. Cloud computing technology generates significant opportunities in transforming the governmental administration into a tool of sustainable development with automated e-government (e-Gov) services (United Nations, 2014). In other words, e-government is a means of communication for governments to interact with its customers, other governmental domain, private sectors, taxpayers, and other entities that need effective and efficient services from a government.

From the context of developed countries, the use of e-government became common practice. The implementation process differs based on how, by whom, why, and

what types of e-government projects are developed and implemented (Janowski, 2015). The e-government services process could also determine the extent to which the project management process and governmental policymaking are balanced, or imbalanced. E-government researchers are still finding it difficult to address the core magnitudes of democratically-based policies and governmental values (Bannister & Connolly, 2014, 2015; Meijer & Bekkers, 2015). The e-government system is expected to provide meaningful and required governmental value with high-quality services through sustainable ICT means.

Lee (2010) defined five e-government evolution stages: (a) presenting, (b) assimilating, (c) reforming, (d) morphing, and (e) e-governance under two umbrellas: (a) citizen/service and (b) operation/technology. Each stage or step of the e-government evolution presents special challenges and barriers that must be overcome before one can advance to the next stage. While the developed nations strive to pass the barriers and provide more advanced services, the developing nations still need to obtain the basic benefits of e-government services.

E-Government Challenges in Developing Countries

In developing countries, it is vital to understand the significant challenges and problems that might affect the implementation of e-governments and could cause them to fail. Heeks (2003) and Dada (2006a, 2006b) reported that the reason as to why there is such a low level of e-government services adoption is primarily that there are high levels of failure in e-government projects and low levels of functionality in developing countries. Sahin (2006) suggested that a lack of appropriate ICT infrastructure is one of

the reasons that could contribute to the failure of e-government services. The ICT infrastructure has a direct relationship with the development of e-government systems to execute the required e-government services. Many developing countries do not have the appropriate and needed ICT infrastructure to deploy e-government services across the nation.

Rana et al. (2013) have reviewed and analyzed relevant 78 research papers studying the challenges, critical success factors, and barriers for e-government services. As a result, poor management, lack of awareness, lack of ICT infrastructure, technological barriers, lack of resources, and legal barriers are the most common challenges and obstacles for e-government services in developing and less developed countries. The study clearly shows that human resources and digital illiteracy, ICT infrastructure, and financial and internal resources are the most critical challenges and obstacles for e-government services in developing countries. Therefore, it is essential to assess the level of confidence and trust of managers to adopt cloud computing for e-government services implementation in developing countries such as Ethiopia.

E-Government Technological Challenges

One of the challenges for e-government services regards the technological barriers that prevent governmental organizational managers from deploying it. This section will present a comprehensive systematic review for understanding and analyzing the obstacles, challenges, and critical success factors of e-government services on these technological issues under ICT infrastructure, security, availability, accessibility, and website design (Wirtz, Weyerer, Thomas, & Moller, 2015). For a long time, the

deployment of the e-government initiative was obstructed by technological issues. For instance, based on feedback from customers, one of the critical obstacles in implementing e-government services is the lack of security (Savoldelli, Codagnone, & Misuraca, 2014).

Security. In the adoption of e-government services, security is a critical factor among other barriers. Security is defined as system protection from accidental or intentional disclosure of sensitive data or information or unauthorized access in altering or copying confidential information. In many studies, researchers have identified that, from both the customers' and governments' perspective, security is one of the most significant barriers that influence the implementation of e-government services across the globe (Savoldelli et al., 2014; Almarabeh & Abu-Ali, 2010; Ebrahim & Irani, 2005). Among the research community, there is a consensus that non-technical issues create a more significant influence on developing countries than technical issues. The general understanding and perception of the customers or users is their lack of trust in electronic transaction methods due to the exposure of personal information, storing, or manipulating data during transaction or access to storage by inappropriate parties. The main barriers to e-government services are privacy, lack of security, lack of resources, mistrust, poor management, lack of awareness, and legal barriers (Al-Rawahna, Chen, & Hung, 2018). Therefore, establishing strong security could help the government and its customers to build trust in using e-government services.

ICT infrastructure. The ICT infrastructure is a combination of software and hardware. Hardware instigates the connections between computing devices and networks; it connects computing devices to either a local area network (LAN), a metropolitan area

network (MAN), or a wide area network (WAN) such as an extranet, intranet, and internet. Even though the cost of ICT infrastructure reduced in recent years, obtaining enough ICT infrastructure for e-government services is still one of the most common barriers of e-government services (Almarabeh & Abu-Ali, 2010). For a governmental organization to be able to deploy and create new communication channels to deliver e-government services, they need an adequate internetworking infrastructure. Ebrahim and Irani (2005) stressed that the availability of fundamental internetworking is crucial for successful e-government services across the governmental sector. Besides, the barriers to implement e-government services were not only internetworking but also a lack of hardware and software. In developing countries, the lack of hardware, software, and internetworking often prevent the successful implementation of e-government services.

Availability. In the development of e-government services that could create many challenges, the government should understand both the *availability* and the *accessibility* of the system to their internal and external stakeholders (Alomari, Woods, & Sandhu, 2012). Understanding the difference between availability and accessibility is crucial. Alkhwaldi, Kamala, and Qahwaji (2018) defined the term *availability* as representing the types and number of e-government services for its citizens around the clock (24/7). They also suggested that the government can achieve the vital promises of e-government projects by integrating multiple factors, such as accessibility and availability. For instance, the availability of numerous e-government services could improve the satisfaction of customers with e-government services. In contrast, the lack of both availability and accessibility would lead to the failure of e-government efforts.

Accessibility. Karkin and Janssen (2014), as well as Scott and Fernando (2015), indicate that, over the years, e-government researchers used the term *governmental values* as supposed to *governmental value* to reflect the plurality of values that are held by the e-government. For instance, the accessibility of e-government services through the website is one of the most widely recognized governmental values. The term *accessibility* is used to explore a wide array of potential customers, irrespective of their technical backgrounds, religions, residences, or disabilities, to make sure that they are afforded equal access to information and services through multiple e-channels. In establishing citizen-centric e-government services, the accessibility of the e-government service is the most important predictor. Therefore, the governmental organizations should ensure the availability and accessibility of their services through their websites to all customers and other stakeholders around the clock.

Website design. The design of e-government websites gained considerable attention over the years. The attention given to the governmental perspective values of e-government services, such as website accessibility, has been inadequate. Karkin and Janssen (2014) clearly stated that e-government websites were the underlying platform to create several channels for interaction between government and customers. In other words, e-government websites were increasingly becoming the main gateway for delivering e-government services to customers (Alateyah, Crowder, & Wills, 2013). Alomari et al. (2012) indicated that one of the determinant factors to accept e-government services is the ability to provide website access to their services. Alomari et al. (2012) concluded that increasing customers' interest in utilizing e-government services;

governmental organizations should develop a well-organized and standardized design content. It is fundamental to include clear instructions, explicit security policies, and reliable tips on accessing the website in the design of the website. Otherwise, having the customers to use e-government services could be a challenge without security assurance or building trust.

E-Government Human Aspects

Once the e-government project overcomes the infrastructure obstacles, the next step could be to create awareness, skills, and marketing tools to motivate the customers on how to access the services. Previous studies have indicated that there are two major dominant human-aspects: a lack of ICT skills and awareness, which contributes to the obstacles of e-government services. Possessing an adequate knowledge about and awareness of e-government services is essential for delivering the much-needed help for the successful implementation of the e-government project. McQuiston and Manoharan (2017) emphasized that the researchers of this emerging field have continued to stress the importance of ICT knowledge and skills for those who are planning to join the governmental sector workforce as the governments around the globe have been increasingly adopting e-government services for its customers.

ICT skills. Furnell and Moore (2014) stated that there are two fundamental types of skills required for the development and deployment of e-government services: (a) ICT based technology literacy and (b) ICT based security literacy. In developing countries, the absence of these two fundamental skills is a crucial challenge for governmental organization managers to adopt e-government services (Furnell & Moore, 2014).

Organization managers often use ICT-literacy to identify people who are incapable of using ICT resources due to a lack of education and computer knowledge. Managers use ICT security-literacy to identify those who are not practicing or lack experience using secure online applications (Furnell & Moore, 2014). Improving the participation of the customers, the government must invest in its customers by providing learning opportunities with essential computer knowledge, security understanding, and use of internet access for their e-government services. Almarabeh and Abu-Ali (2010) emphasized the importance of preventing the rise of two sectors within the society (i.e., information-poor and information-rich) by training its customers.

Lack of awareness. In general, due to several reasons, the awareness of e-government services and its benefits by the customers is shallow. This lack of awareness from the citizen's side contributes directly to barriers of e-government and creates a lack of trust in the e-government adoption process. Awareness is a process of a person's understanding of other activities while relating those understandings from their perspective and actions. Mahmood (2016) stated that, to achieve the successful diffusion of e-government services, government organizations need to promote new e-government services with attractive awareness campaigns and trust among customers for sustainable e-government services. In developing countries, lack of awareness about the benefits of e-government applications remains a critical factor in user adoption. In the same study, the researcher also examined the three concepts that can help to develop a relationship and trust among (a) technology, (b) e-governance, and (c) the government itself.

E-Government Social Challenges

When it comes to the adoption of electronic services, it is not only the technical challenges but also the social challenges that affect the deployment of e-government services. For society, lack of skills, awareness, and culture of the community, affects the cooperation and joining between people in the society, affecting social inclusion, particularly of disadvantaged and vulnerable groups (Ali et al., 2018). The social challenges regarding e-government include digital divides, language, education, income, and culture.

Culture. One of the most critical social challenges facing e-government services is that governmental organization managers need to overcome cultural problems such as behavior, beliefs, religion, and values (Alomari et al., 2012). These researchers also classified the culture into three categories: (a) national culture, (b) organizational culture, and (c) security culture. In the context of their study, security culture is the customs of a specific society and socio-behavior, which affects the citizen's security practice. Almari et al. (2012) concluded that governments need to work on improving the social life of their customers and establish a knowledge-based society before they attempt to adopt e-government services. If not, the customers' resistance to change to adopt e-government services could lead to adverse outcomes in participating in e-government services.

Financial Challenges. In developing countries, lack of financial support is one of the major obstacles to the adoption of e-government services. Even though the government put in place an effective strategy to overcome the technical challenges, this situation could not guarantee the government to have successful initiatives of e-

government. Rana, Dwivedi, and Williams (2013) stated that the funding of e-government initiatives is a crucial challenge for governmental organizations that have been struggling with the high costs of the maintenance and the deployment of ICT systems. These researchers also asserted the lack of financial recourses as a significant challenge of e-government services, mainly in developing countries. Very little research has been conducted regarding the impact of these challenges in cloud-based e-government service adoption from the governmental sector context (Alkhwaldi et al., 2018). Their recommendation is for the government to provide support not only for the deployment of e-governments but also for long-term financial support as it is a long-term process. The previous literature has focused on several factors of e-government challenges.

Cloud Computing in the E-government Context

Many governments recognized the potential opportunities delivered by ICT systems to improve efficiency and provide adequate services to their customers by deploying e-government systems. Mohammed et al. (2018) examined how several developing countries were facing an array of governance challenges, such as poor governmental management, responsibility in governmental decision-making powers, corruption, and lack of appropriate transparency. Researchers, such as Mohammed et al. (2018), explored several different sources of literature as to how e-government systems helped some governments to use it as a tool to improve its efficiency and efficacy of the government services for its customers. All this research has one thing in common: namely, that the use of ICT for e-government services demands high levels of education

in users, proficient technical capabilities, sufficient technological systems, and significant levels of resources, which entails significant expense, particularly in developing countries. Mohammed et al. (2018) suggested that developing countries who are in the early stages of implementing e-government services should explore the newly-emerging ICT technologies, such as cloud computing. Some of their reasons for recommending cloud computing are that new technology can economically extend services and create considerable opportunities in offering citizen-centered services.

E-Government Use of Cloud Computing

E-government is one of the applications of ICT to bridge the information and communication between government to government (G2G), government to customers (G2C), government to business (G2B), and government to employees (G2E) modality of society. Durao et al. (2014) stated that the use of e-government applications in the cloud had fascinated the attention of practitioners, researchers, and investors alike. At the same time, utilizing cloud computing for e-government services like other internet applications has some challenges. Dash and Pani (2016) studied the benefits and challenges of using cloud infrastructure for e-government services in India. Through their study, the researchers indicate that the government of India approved the national e-governance plan (NeGP) from 2003 and 2007 to provide impetus and lay foundations throughout the country. NeGP aims to involve private sectors and create a business-centric and citizen-centric environment for good governance.

Despite the NeGP's best efforts, the findings reported that most of the stated in India were inadequately equipped with the personnel and high-skilled workforce required

to handle the list of issues involved in e-government services. Even though the government of India formulated the e-governance strategy, which involved localizing execution and decision-making—a plan that aimed at the service-oriented approach and involved various stakeholders, the government still faces significant challenges such as poverty, technical illiteracy, unawareness, inequality, and infrastructure. After discussing the benefits of cloud computing, these researchers concluded that the government could provide effective and efficient e-governance services using cloud infrastructure (Dash & Pani, 2016). However, several challenges of cloud computing adoption for e-government services generated from its newness and the relative development of the market for cloud services.

Ali et al. (2018) proposed a hybrid model for the use of cloud computing for e-government services. In their study, Ali et al. (2018) focused on developing countries that are experiencing the revolution of the e-government system in its deliverance of easy and straightforward services for their customers. Based on their investigation on several kinds of literature, they understood that several inhibitors prevent the effective use of e-government for services, which, ultimately, disintegrate into two inhibitors: technical and nontechnical. Both technical and non-technical inhibitors negatively affect the e-government system's service to the customers. Based on their study and analysis of the literature, they summarized the benefits of using cloud computing in multiple aspects of e-government services. At the end of their research, these researchers proposed an abstract hybrid model to adopt cloud computing for e-government services, which helps

the managers to identify and classify e-services based on specific domains (Ali et al., 2018).

E-Government Opportunities in Cloud

For the past two decades, the purpose of using ICT for e-governments was to improve effectiveness, efficiency, accountability, and transparency of government. The objective of e-government was to move citizen paper-based services to electronic services, but the traditional ICT based infrastructure does not help the governmental organizations to deliver the services adequately and efficiently. In contrast, cloud computing provides opportunities for e-government services by reducing costs, promoting economic development, enhancing accountability and transparency, improving service delivery, improving governmental administration, and facilitating an e-society (Dash & Pani, 2016).

The cloud lowers costs. As a new phenomenon, cloud computing offers cost-effective application services to governmental and private organizations. One way in which cloud users are reducing their ICT costs is by using their cloud services provider's infrastructure, such as computing processors, storage space, application software, hardware, network bandwidth, and pay for these services as used basis like utilities (Wang et al., 2014). For instance, the cloud-based application helps the organization to reduce facility management and energy costs by using cloud servers as supposed to local servers (Cheng et al., 2015). Cheng et al. (2014) noted that cloud computing has a direct benefit in the supply-chain industry. The most vital part of cloud computing is the ability to lower operating costs by using cloud computing resources.

The cloud promotes efficiency. The best part of cloud computing services is efficiency through board availability, pay-per-use, customization, self-service, and elasticity (Stipravietis et al., 2013). While achieving the efficient use of cloud computing, these key features make cloud computing an attractive option for governmental organizations to manage their technology costs.

The cloud promotes flexibility. Cloud computing provides flexibility by automating the process of task scheduling, resource scheduling, and backing up the data. Then, the system allows for the immediate release of those resources as needed (Mohan & Satyanarayana, 2015). This automation helps governmental organizations to deliver efficiency through e-government services. Cloud computing technologies provide flexibility and elasticity while also allowing cloud-based resources to be more relevant and useful (Butoi, Tomai, & Mocean, 2013). The power of cloud computing changed the way computing power generated and consumed. Cloud computing has now become the next universal model of consuming ICT in governmental organizations and is paving the way to replace the traditional model of computing (Catinean & Candea, 2013). Cloud computing facilitates ICT resources from computing power to computing infrastructure, business processes, applications, and personal collaboration users of cloud computing resources (Paul & Dangwal, 2014).

E-Government Challenges in Cloud

Governmental organizations face challenges with the wide diffusion of e-government adoption in developing countries. The primary purpose of adopting e-government services is to manage data, enhance governmental services, and expand

communication channels for customers. At the same time, it also helps the government to increase productivity, share global knowledge, grow the business economy, and automated business processes and communications (Ali et al., 2018). Many governmental organizations face even more challenges when they migrate their system to the cloud. From the cloud service provider's perspective, the challenges are delivering adequate security, defining and maintaining service level agreements, managing business risks, and maintaining application performance (Demirkan & Goul, 2013). In the same study, the researchers stated that most of the risks were in the technical area, and other challenges for organizational leaders include pricing, lack of creativity, disruption, and services, among others. The risks involved in moving to the cloud can be organizational, operational, legal, and technical, and can affect both sides: user and cloud service providers.

Summary and Conclusions

As discussed in the literature review, Tornatzky and Fleischer's TOE framework and Rogers's DOI theory laid the foundation for much of the technological and innovation adoption included in the scholarly research of the last decade. The theoretical frameworks and models helped understand the factors that affected the adoption of cloud computing for e-government services in governmental organizations. The literature review helps to carefully examine the technical complexity, relative advantages, compatibility, and organizational factors, such as size, which influence the intent to adopt new technologies in a developing country such as Ethiopia. Some researchers expanded the discussion by identifying several factors that affect the e-government services and

adoption of cloud computing. The factors identified were cost, technical issues, business risks, and maintaining the applications. What is still missing in this scholarly discussion was an explanation as to why most managers at governmental organizations were reluctant to trust cloud computing for e-government services in Ethiopia, as well as how a governmental organization in Ethiopia overcame this lack of trust.

To address the above factors in Chapter 3, I discuss the methodology, starting with the brief introduction of the research methodology, and research design and rationale. The selected methodology for this study was qualitative, using a holistic, single case study research methodology that could provide a deeper understanding of how a governmental organization in Ethiopia overcame the factors that adversely influenced managers of other organizations to the extent that they distrusted and decided against adopting cloud computing for e-government services. In accordance with the methodology, I discuss participant selection logic, instrumentation, procedures for recruitment, participation, and the data collection and data analysis plan. Demonstrating the validity of the study, I also address issues of trustworthiness, such as credibility, transferability, dependability, confirmability, and ethical procedures. Finally, in Chapter 3, I conclude the chapter by providing a summary and transition to Chapter 4.

Chapter 3: Research Methodology

In this study, I selected the qualitative, using a holistic methodology, and a single case study design. Yin (2018) stated that a case could be a single organization, a single location, a single event, a group, a community, or some other unit in which a researcher examines in-depth data relating to several themes. In this study, I followed a single case study of an organization to provide a deeper understanding of how a governmental organization in Ethiopia overcame the factors that adversely influenced managers of other organizations to the extent that they distrusted and decided against adopting cloud computing for e-government services. The single case of an organization in this study was located in Ethiopia. Ethiopia has the typical characteristics of a newly-developing country in Africa. Consequently, the results of this study could be relevant to similar developing countries. A case study is useful for conducting in-depth research on a particular organization, program, individual, activity, event, or process; strict parameters for time and space are put into place for the purposes of the study (Leedy & Ormrod, 2015; Yin, 2014). A combination of the DOI theory with the TOE framework was used as a conceptual framework to provide a deeper understanding of how a governmental organization in Ethiopia overcame the factors that adversely influenced managers of other organizations to the extent that they distrusted and decided against adopting cloud computing for e-government services.

The target population was managers who work for the selected governmental organization and have a say in cloud adoption for e-government services strategies in Ethiopia. The source of qualitative data was obtained from a purposively selected sample

of 12 participants from a governmental organization located in Ethiopia who helped me to reach data saturation. I collected data, primarily, by conducting face-to-face interviews, undertaking semistructured observation, and conducting a review of project documents to obtain high-quality data. The selection of participants was focused on the combination of managers and decision-makers from a governmental organization in Ethiopia who adopted cloud computing to understand how they overcame the negative factors. Based on these criteria, I used a purposeful, nonprobabilistic sampling technique to invite 12 expert managers from a governmental organization in Ethiopia for semistructured interviews.

I began Chapter 3 by restating the research purpose, as presented in Chapter 1. In the remaining part of this chapter, I present the research design and rationale by reiterating the research questions that I originally presented in Chapter 1. I also highlight the central concepts of this study and locate the research approach in the context of broader scholarship on the subject. I provide a rationale for the tradition in which I chose to conduct the work. In this chapter, I also define and explain the researcher's role as observer, participant, or observer-participant. In the next section of this chapter, I focus on the methodology used for this study, starting with participant selection logic by identifying and justifying the population and sampling strategy. The methodology section of this chapter includes instrumentation, data collection instruments, and research-developed instruments. In the methodology section, I conclude with procedures for recruitment, participation, data collection, and data analysis plan. In Chapter 3, I also cover the issues of trustworthiness that included credibility, transferability, dependability,

confirmability, and inter- and intra-coder reliability. The purpose of this chapter is to summarize the foundation of the study and highlight the appropriateness of the selected methodology pertaining to the study.

Research Design and Rationale

The notion that cloud computing is vulnerable to both internal and external attacks had a significant impact on governmental organizations and customers in a developing country, such as Ethiopia; hence, there was a distrust of cloud computing, and many organizations choose to store their data outside their premises (Seifu et al., 2017). The general research problem was how to overcome factors that cause most of managers at governmental organizations in developing countries such as Ethiopia to be reluctant to trust and adopt cloud computing for e-government services, especially while some managers of a governmental organization overcame this lack of trust. Unfortunately, the selected organization was one of the first organizations to migrate its front-end applications such as mobile apps and web based applications to the cloud. On the other hand, unlike other governmental organizations in Ethiopia, the one upon which I chose to focus, decided to make the dramatic move to trust, and to adopt cloud computing which made this organization my targeted partner for this study. In terms of my selection criteria, when I was looking to identify a prospective target organization, I searched for a governmental organization in Ethiopia that had already overcome their lack of trust in cloud computing. The specific research problem that I sought to address in this study was why managers of a governmental organization in Ethiopia ultimately chose to trust and adopt cloud computing for e-government services, despite their initial uncertainty or

misgivings regarding security and privacy. The overarching general research question that drove this study was how a governmental organization in Ethiopia overcame the factors that adversely influenced managers of other organizations to the extent that they distrusted and decided against adopting cloud computing for e-government services?

The use of a qualitative methodology facilitates better interactive communication between selected participants who are more familiar with the information system at the management level than other methodologies. In the qualitative research methodology, there are five design choices: a case study, narrative, grounded theory, ethnography, and phenomenology. The purpose and concentrations of the five designs are different (Lewis, 2015; Pfadenhauer & Grenz, 2015). The focus of this study was to merge the interview data from various sources and identify the right qualitative research design that helps an efficient way of answering *how*, *why*, and *what* of a case. For instance, phenomenological researchers focus on understanding the essence of the research participants' lived experiences (Cibangu & Hepworth, 2016). The phenomenology research design could not have supported this study because it can only describe the characteristics of culture, focuses on the commonality of a lived experience within a particular group and extrapolates on the actual life experiences of the participants. Researchers who choose the ethnography methodology generally seek to describe and interpret a culture-sharing group (Lewis, 2015; Simpson, Slutskaya, Hughes, & Simpson, 2014).

Moreover, the ethnographical research design could not have supported this study because the ethnographical researcher explores a human society within the cultural involvement and the daily life of the participants. The primary purpose of grounded

theory is to emphasize developing the theory rather than testing a theory (Berthelsen, Grimshaw-Aagaard, & Hansen, 2018). Researchers use a narrative approach to study community-based action research projects (George & Selimos, 2018). The primary purpose of this study was not to interpret a group's culture or seek the essence of research participants' characters with the same background but rather to understand the phenomenon of cloud adoption experience. Consequently, phenomenology, ethnography, grounded theory, and narrative research design would not have been appropriate for this study. For the purpose of seeking to understand how a governmental organization in Ethiopia overcame the factors that adversely influenced managers of other organizations to the extent that they distrusted and decided against adopting cloud computing for e-government services using a single case study as a research design for this qualitative methodology study was appropriate.

The case study approach allows in-depth, multi-faceted explorations of complex issues with their real-life settings, and it also offers additional insights into *what* gaps exist in its delivery or *why* one implementation strategy might be chosen over another (Crowe et al., 2011). For this study, I deemed a case study research to be a suitable research strategy because the proposed research addressed a contemporary phenomenon of trusting and adopting cloud computing, over which the researcher had no control. The study was largely exploratory and addressed the *how* and *why* questions, (Darke, Shanks, & Broadbent, 1994; Yin, 2014).

Yin (2018) suggested that, unlike other methodologies, a case study allows the use of *how* and *why* interview questions to obtain quality data. In a case study, the

researcher can create new knowledge and capture both continuous and previous data from real-life experiences, which would not be possible using other methodological approaches. Leedy and Ormrod (2015) asserted that, in situations where researchers are attempting to answer *how* and *why* questions, a case study was the best approach to adopt to understand contemporary phenomena, as well as in situations when the researcher has little or no control over behavioral events. The issue was that too many managers in Ethiopian governmental organizations lack trust in adopting cloud computing for e-government services to expand their ICT system to the cloud efficiently. Amerson (2011) suggested that a case study design could be suitable for understanding or exploring a simple or complex issue and may eventually add new knowledge to the research community or further enhance what may be familiar from previous research. Therefore, a single case study research design was appropriate for conducting a two-way interaction with participants to understand managers' trust in adopting cloud computing for e-government services. A single case study also was useful to explore how a governmental organization in Ethiopia overcame this lack of trust from multiple participants' perspectives.

To determine the organization covered by this study, I used the top three elements, organizational readiness, organizational size, and top management support along with outcome variables of having adopted or not adopted cloud computing, as conditions. At the beginning of this study, I was able to identify the organization based on the organizational size (mid-size or large organizations) and the use of cloud computing for e-government services. In a case selection, I was focused on the

governmental organization that is a mid-size to large organization. This organization had adopted cloud computing for their services, and their headquarters in Addis Ababa, Ethiopia. The reason for selecting an organization that is located in Addis Ababa was that almost all the large organizations in Ethiopia are located in Addis Ababa. Addis Ababa is not only the capital city of Ethiopia but also the capital city of Africa.

Role of the Researcher

The role of the researcher is to conduct scholarly research by selecting participants, collecting data, performing analysis, and interpreting the results (Taylor, Bogdan, & DeVault, 2015). As a researcher, I selected a research methodology and design, identified expert managers, approached willing participants, interviewed chosen participants, and analyzed their responses. In a qualitative method, Cui (2015) stated that the researcher is playing an insider-outsider role. Researchers have a role in collecting, reviewing, managing, and analyzing the data, as well as interpreting the results. While interpreting and articulating the data, the researchers also have a responsibility to be clear, objective, and concise (Malagon-Maldonado, 2014). In this single case study, I played a significant role in data collection by compiling, coding, analyzing, and interpreting the data myself.

As a researcher, I interviewed 12 expert managers, which helped to reach the point of data saturation, from a governmental organization in Ethiopia who already implemented cloud computing for e-government services. I also worked in the ICT industry field for 23 years and implemented ICT infrastructure for over two decades. For the last 12 years, I worked in Ethiopia by running my own business but also worked for

both private and governmental organizations. Despite my experience in the industry, I do not have any personal or professional relationship with either the research participants or any governmental organization that was involved in the study. To ensure that the collected research data are reliable, Halpern and Leite (2015) and Nelson, London, and Strobel (2015) noted that the researchers need to strive for neutrality and to uphold good ethical practice during the interpretation and analysis of the collected data. As a qualitative researcher, I met with the study participants in their natural settings and attempted to make sense of phenomena regarding the meanings that the participants brought to the study.

The Belmont Report (1978) set ethical guidelines for researchers to gain an understanding of ethical issues that include respect for people, beneficence, and justice related to the research and the participants (Musoba, Jacob, & Robinson, 2014). Based on the Belmont Report protocol, I treated all expert managers who participated in this study as autonomous agents, no harm was imposed, and I have protected their rights during this study. Belmont Report protocol extends its ethical requirements to the ethical role of the researcher and voluntary participation (Musoba et al., 2014). Following the Belmont Report guidelines, I secured voluntary participants only from identified governmental organization's managers and treated the participants with dignity, kindness, and impartiality. As required by the Belmont report, I also collected data in a trustworthy manner, adhered to the procedures, and mitigated any potential bias.

A researcher's background and worldview generate bias. In a qualitative study, bias is an inevitable problem, and it could misrepresent the assessment of information

(Leedy & Ormrod, 2015). One of the challenges that I worried about encountering stemmed from pre-existing knowledge and experience of governmental organizations as a result of professional work over for the last 12 years. In most cases, researchers with a strong background and experience in the subject matter could unintentionally introduce bias into the study (Taylor et al., 2015). The first thing that I did was to divorce myself from the worldviews and a strong background in the subject matter through a process called bracketing. Malagon-Maldonado (2014) recommended that, by using bracketing, a researcher could repress their pre-existing prejudices during the preparation, interviewing, analyzing, and documentation periods to alleviate bias.

In addition to the bracketing process, I also kept journals and use member-checking to mitigate bias. Sorsa, Kiikkala, and Astedt-Kurki (2015) suggested that maintaining a journal and reviewing the notes with a third party will help in mitigating bias from the research processes. These journal-keeping and note-reviewing processes helped to alleviate bias and adequately safeguard the study from misinterpretations. Flick (2014) recommended that to capture the researcher's observations accurately, the researcher needs to record reflexive field notes at every workshop. I worked hard to remain unbiased by keeping a reflexive journal. During the interview process, I not only shared a summary of the interview and obtained feedback from the participant, but I also requested copies of documents and sought permission to observe the participants' reactions (Simpson & Quigley, 2016). I followed the interview protocol to check the accuracy of the data collection process and mitigated bias throughout the process.

Methodology

The methodology of this study was qualitative, using a holistic, single case study research methodology through which I was able to gain a deeper understanding of how a governmental organization in Ethiopia overcame those factors that adversely influenced managers of other organizations to the extent that they distrusted and decided against adopting cloud computing for e-government services. The qualitative research methodology helped the researcher to understand participants' phenomena, experiences, perspectives, and decision making (Kaczynski et al., 2014). The reason I chose qualitative research methodology over the other methodologies was the ability to collect knowledge from interviewing participants that better helped to predict the human experience than analyzing statistical variables. In gaining a better understanding of the complex phenomenon or human experiences, Marshall and Rossman (2015) noted that the qualitative research methodology was better than the quantitative research methodology because it involved multiple facets of life such as the observation of the duplication of ideas, witnessing the development of concepts, and human interaction. There were three primary sources of data collection: semistructured interviews, semistructured observation, and organizational documentation on cloud adoption. The data collection and analysis of multiple sources of data provided depth in triangulation.

Participant Selection Logic

In a qualitative study, identifying the right population and determining the proper sampling was crucial, because the intent and objective in this study were to select semistructured interview participants but not to record or count the number of opinions

(Taplay, Jack, Baxter, Eva, & Lynn, 2014). The case for this study was a governmental organization in Ethiopia that adopted cloud computing for e-government services in the last decade. My research indicated that there was one governmental organization in Ethiopia that had made the decisions to trust and adopt cloud computing for their e-government services, despite their initial uncertainty or misgivings regarding security and privacy. From the perspective of the researcher, knowing the population helped in defining the right sample. The target population was the different levels of managers who work for a governmental organization in Ethiopia, which adopted cloud computing for e-government services. The rationale behind selecting this country was to increase the credibility and trustworthiness of the research data by choosing a developing country with a unique culture, economy, and environment. Ethiopia had the typical characteristics of a newly-developing country in Africa. Consequently, the result of this study could be relevant to similar developing countries.

Having investigated over 20 governmental organizations in Ethiopia, I concluded that the organization that I decided to select was the only organization that had overcome their initial distrust of cloud computing services. The targeted population for the study was in the following functional areas of the organization: executive management team, integrating marketing communication team, direct sales application development team, ICT application design and delivery team, digital product management team, business application team, ICT service operations team, software development tools team, security operation center team, ICT operations, system administration, and ICT infrastructure

design and delivery team. Table 1 includes the descriptions of various interconnected organizational functions that form the cloud adoption process.

Table 1

Organizational Functions

Functional area	Description of the function
Executive Management Team (EMT)	The function of the executive management team is to define the vision and goals of the entire organization by implementing policies and procedures.
Integrated Marketing Communication Team (IMCT)	The function of an integrated marketing communication team is to plan an integral role in communicating cloud-based brand messages to a broad audience, and that helps in integrating all essential components of marketing to communicate the same messages to prospect and existing customers.
Direct Sales Application Development Team (DSADT)	The function of the direct sales application development team is to research competing products, identifying opportunities to increase sales, and assisting in the development and execution of cloud-based sales and marketing plans.
ICT Application Design and Delivery Team (ICT-ADDT)	The function of the ICT application design and delivery team is to take responsibility for the technical design and implementation of cloud-based software solutions.
Digital Product Team (DPT)	The function of the digital product management team is to be a mediator between the technical crew and customers, communicating customers' needs and translating those needs into new product features for the team to design cloud-based applications.
Business Application Development Team (BADT)	The function of a business application development team is to create, test, and program cloud-based application software for end-users. They also work closely with computer engineers and analysts in using different languages to develop the necessary specifications for cloud-based application software.
ICT Service Operation Team (ICT-SOM)	The function of the ICT service operations team is to monitor an organization's on-premises and cloud-based network, servers, and computing systems for performance and irregularities issues. They also assess error logs and system data, along with user reports, to determine which areas require repairs or improvements.
Tools Development Center Team (TDCT)	The function of the tools development center team is to develop a computer program that is used by the software developers for creating, editing, supporting, maintain, and debugging other programs, frameworks, and applications.
Security Operation Center Team (SOCT)	The function of the security operation center team is a centralized one that is shared and managed across an organization's processes, employees, and technology to monitor constantly and improve an organization's security posture while protecting, detecting, analyzing, and responding to cybersecurity incidents.
System Administration Team (SAM)	The function of the system administration team is to oversee user management, backup and recovery, system monitoring, and access control to the cloud system.
ICT Infrastructure Design and Delivery Team (ICT-IDDT)	ICT infrastructure design and delivery team comprise senior network engineers who are responsible for installing, managing, improving, and supporting the service provider's complete infrastructure and services.

The source of qualitative data was obtained from one organization in Ethiopia, and a purposively selected sample was 12 participants from the list of 17 ICT managers that was provided by the Director of Integrated Marketing Communication Management, who worked as a gatekeeper for this study. In order to narrow the list of 17 managers down to 12 participants in total, I considered each individual's ability to provide distinctive opinions or perspectives. As such, I decided to select one volunteer participant from each functional area. The criteria to select 12 participants from the list of 17 managers was the ability to obtain different opinions from 12 different functional departments that drive one volunteer participant from each functional area. I conducted face-to-face interviews, undertook direct observation, and conducted reviews of project documents to obtain high-quality data. Selecting the correct sampling approach enhances the trustworthiness of the research (Robinson, 2014).

For qualitative research, Robinson (2014) suggested four steps of sampling: (a) defining a sample universe, (b) deciding a sample size, (c) selecting a sampling strategy, and (d) sample sourcing. Taplay et al. (2014) proposed purposeful sampling as a tool to identify significant participants with substantial experience in the research topic and their alignment with the purpose of the study. These researchers also noted that the researcher must select the participants that have multiple roles in their organization to maximize the benefits of purposeful sampling, and the research needs to ensure that the selected samples were from the original community where the study begins. With that discipline, the participants may shed light and provide insights that could help answer the research

questions. I highlight the relevance of each function to the cloud adoption process and the purposeful sampling criteria in Table 2.

Table 2

Purposeful Sample Selection Criteria

Functional area	Relevance to the study
Executive Management	The role of executive managers is to design, develop, and implement strategic plans of cloud adoption for e-government services. Their responsibility and their action helped in understanding the technological, organizational, and environmental negative factors which form the foundation and TOE framework of the study.
Integrated Marketing Communication Team	The experiences of an integrated marketing communication team helped in understanding the overall factors that adversely influenced managers of other organizations to the extent that they distrusted and decided against adopting cloud computing and how they overcame the situation.
Direct Sales Application Development Team	The experience of direct sales application developers helped the study in identifying the influence of customers' expectations, the use of cloud computing, and other technological negative factors and how they overcame them.
ICT Application Design and Delivery Team	The knowledge and experiences of ICT application design and delivery teams helped to increase our understanding of how they handle the factors that adversely influenced managers to distrust and decide against adopting cloud computing, and how they overcame them.
Digital Product Team	The on-ground knowledge and experience of the digital product team helped to deepen our understanding of the negative factors that can affect the relationship between the technical team and customers, communicating customers' needs, and how they translate those needs into new product features for the team to design cloud-based applications.
Business Application Development Team	The business application development team creates, tests, and programs cloud-based applications software for end-users. They also work closely with computer engineers and analysts in using different languages to develop the necessary specifications for application software. They shared valuable insights about how they overcame the negative factors and migrated from on-premises to cloud solutions.
ICT Service Operation Team	The experiences of the ICT service operation center personnel increased our understanding of customers' expectations and the common challenges or negative factors that lead managers to distrusted and decided against adopting cloud services offered, as well as how they overcame them.
Tools Development Center Team	The experience of a tools development center team informed the study in terms of broadening our understanding of all the factors that adversely affect the process of moving from on-premises tools to cloud-based tools for developers, and how they overcame such challenges.
Security Operation Center Team	The experiences and knowledge of the security operation team had further our understanding of the negative security factors that influence managers not to trust cloud computing for e-government services and how they overcame this.
ICT Operations Center Team	The experience of the ICT operations team helped the study in heightening our understanding of all the negative factors that affect the transition from on-premises systems to cloud computing systems, and how they overcame these difficulties.
System Administration Team	The experiences of the system administration team helped the study in terms of increasing our understanding of the negative factors that affect the system administration team when they transit from an on-premises environment to a cloud environment of user management, backup and recovery, system monitoring, and access control to the cloud system.
ICT Infrastructure Design and Delivery Team	The on-ground experience and knowledge of the ICT infrastructure design and delivery team helped the study in terms of improving our understanding of the negative factors during the transition from on-premises infrastructure to cloud services, and how they overcame such difficulties.

The source of qualitative data was obtained from one organization in Ethiopia, and a purposively selected sample was 12 participants that helped to reach data saturation. In accordance with my criteria, the stipulation that I needed to ensure that I had access to one volunteer participant from each of the 12 different functional areas. I was able to recruit all 12 participants by contacting them in person and by phone for this study. In some cases, I asked the gatekeeper to send my contact information to prospective participants through the organization's e-mail system, requesting that they contact me directly at a time of their convenience if they would like to be involved in the study. Out of the 12 original participants, only one participant was unable to participate and was replaced by another participant. The participant selection criteria by functional area are listed in Table 3.

Table 3

Participant Selection per Functional Area

P.No.	Functional area	Designation	n
P01	Integrated Marketing Communication Team (IMCT)	Director	1
P02	Direct Sales Application Development Team (DSADT)	Manager	1
P03	ICT Application Design and Delivery Team (ICT-ADDT)	Head ICT	1
P04	Digital Product Team (DPT)	Manager	1
P05	Executive Management Team (EMT)	CIO	1
P06	Business Application Development Team (BADT)	Manager	1
P07/P10	ICT Service Operation Team (ICT-SOM)	Managers	2
P08	Tools Development Center Team (TDCT)	Manager	1
P09	Security Operation Center Team (SOCT)	Manager	1
P11	System Administration Team (SAM)	Manager	1
P12	ICT Infrastructure Design & Delivery Team (ICT-IDDT)	Manager	1
	Total		12

The nature of this study was a qualitative research methodology that provided a deeper understanding of how a governmental organization in Ethiopia overcame the factors that adversely influenced managers of other organizations to the extent that they distrusted and decided against adopting cloud computing for e-government services. Research in developing countries is limited (Dubey et al., 2016). The targeted population for this study included the different levels of governmental organization's managers, who were decision-makers in Ethiopia. Based on the selection criteria shown in Table 2, I identified 12 managers, as shown in Table 3, from the same governmental organization in Ethiopia who trusted and adopted cloud computing for e-government services.

For a case study, Armbrust et al. (2010) suggested that a quantity of 10-15 participants should be enough to obtain quality data and understand the case of work-related situations. Since there is not a single formula or criterion to determine the sample size, this qualitative single case study was 12 participants from the same governmental organization in Ethiopian based on the research objective, methodology, and available resources. Despite the number of participants, this study reached the required data saturation based on adequacy and appropriateness. Yin (2018) cautioned that the ability to enter data saturation is more important than the size of the sample. To achieve a saturation level, scholars have different views on the adequacy of the sample size. Since the sample size depends on several factors, including the research questions and the purpose of the study, Elo et al. (2014) noted that the researchers do not recommend a specified sample size for qualitative studies. The sample size was determined based on the purpose of the research and the research question. The only time the researchers have

an ideal sample size is when research data saturation occurs (Fusch & Ness, 2015). In terms of a sample group, I selected 12 participants from an Ethiopian governmental organization who were eligible and interviewed the participants until no new emerging themes identified.

The selection criteria of semistructured interviewees included managers (a) who had compressive knowledge in ICT, (b) who had a position with responsibility and have a say in adopting cloud computing for e-government services strategies, and (c) who were employed with the organization and who already adopted e-government services for their customers. After the organization identified and understood the organizational structure, I added one more criterion to obtain different opinions or perspectives of managers from each functional department that was involved in the cloud adoption process, as shown in Table 2. Yin (2018) suggested that the participants should bring a degree of information from their unified experience. For instance, the selection of participants was focused on the combination of managers and decision-makers from a governmental organization who implemented cloud computing for e-government services and had been identified by the gatekeeper of the selected organization. Based on these criteria, I used a purposeful non-probabilistic sampling technique to invite 12 expert managers to engage in the study through phone calls, their organization's e-mail system, or in-person meetings at their office until no new emerging themes could be identified in their responses.

Instrumentation

The primary technique for a qualitative single case study is that of asking questions of research participants through semistructured interviews, conducting

semistructured observation, and collecting relevant documents (Leedy & Ormrod, 2015). In this research, I collected data myself by using semistructured interview techniques, undertaking semistructured observation, and analyzing project documents to provide a deeper understanding of how a governmental organization in Ethiopia overcame the factors that adversely influenced managers of other organizations to the extent that they distrusted and decided against adopting cloud computing for e-government services. For this study, the possible qualitative data collection instrument and sources to address the proposed research questions included: (a) audio recordings and transcripts from semistructured interviews (Appendix B), (b) semistructured observations of the participants' interpersonal and team behavior and team interaction (Appendix C), and (c) analysis of the organizational publicly published documents. The organizational documents included the organization's strategies for e-government services, plans within the organization, and the organization's yearly reports on ICT strategies for the last three years. Friedrich-Baasner et al. (2018) proposed that face-to-face semistructured interviews could be the right medium through which to obtain the quality data that can match with the coding scheme generated from the existing environment or factors and examine the unknown effects as of now.

When a researcher builds trust between themselves and participants, the researcher can obtain reliable data using semistructured interviews (Nguyen, 2015). The semistructured interview was one of the sources of data that allowed this study to established participants' perspectives on their experience relating to the research topic. The most critical function of semistructured interviewing was the ability to learn about

the background and experience of the interviewee, as well as their perceptions in relation to the research questions (Castillo-Montoya, 2016). The use of semistructured interview procedures as a guide for interviewing with research participants and suggested a semistructured interview protocol helped in controlling the sequence and flow of questions. As a researcher, I followed an interview protocol (Appendix A) to establish consistency and accuracy in collecting data (Wang, Xiang, & Fesenmaier, 2014). I recorded each interview using multiple digital instruments, such as a smartphone for audio recording and a Sony recorder for audio-recording as a backup recording and Microsoft OneNote to save the noted. Then, I used the latest version of computing software to analyze the data and compose a table of patterns and emerging themes in word processing.

The semistructured observation was the second instrument used to gather data by watching events or behaviors in its natural environment in the field of research (Sykes, 1977). Even though observation can be used both as a data collection method and a research method, in this study, I used observation as a data collection method. Observation can be unstructured, semistructured, and structured. For this study, I used semistructured as it was listed in Appendix C. For a better understanding of the team reaction in cloud computing and interaction among themselves, I participated in mobile app development meetings and cloud adoption strategy meetings. I also visited their data center, network infrastructure, and applications that were used to access cloud computing. As an observer, I had more than one role. First, I used all my senses to collect data effectively. At the same time, I observed and remained detached enough from the

subjects to make sure I was observing and collecting the data that was suited only to the research questions and purpose. I used overt observation, which required to be open about the study intentions and informed the participants to make sure that they were aware of what was happening. A critical advantage of overt observation was that it enables the researcher to establish rapport with the participants because I, from the beginning, was open and honest about the intention of this study.

Document analysis was the third instrument that I used. It is a common research method, a crucial research tool, and an invaluable part of most schemes of triangulation. Document analysis is a form of qualitative research that helps the researcher to interpret the documents to give voice and meaning to a research topic (Bowen, 2009). I used the document analysis tool to analyze the organizational documents such as an organization's strategies for cloud services, plans within the organization, and the organization's reports on cloud adoption strategies for the last three years. O'Leary (2014) discussed the three primary types of documents which are (a) public records (the official, ongoing records of an organization's activities); (b) personal documents (first-person accounts of an individual's actions, experiences, and beliefs such as Facebook posts, duty logs, reflection/journals, and newspapers); and (c) physical evidence (flyers, posters, handbooks, and training materials). Based on O'Leary's guidance to complete the selected methodological triangulation, I collected (a) Connect Africa to the Future with Microsoft Azure, (b) mobile app publication, (c) Sabre passenger reservation technology solution, and (d) annual reports.

Before I started the document analysis, I undertook a detailed planning process to ensure that this study would produce reliable results. O'Leary (2014) outlined an eight-step planning process for document analysis which I followed in that I (a) created a list of texts to explore (samples, population, participants), (b) considered how texts would be accessed with attention to cultural barriers, (c) acknowledged and addressed biases, (d) developed appropriate skills for research, (e) considered strategies for ensuring credibility, (f) knew the data one was searching for, (g) considered ethical issues (confidential documents), and (h) had a backup plan.

Procedures for Recruitment, Participation, and Data Collection

Recruitment. The targeted participants for this study were the managers of a governmental organization who have responsibility for and a say in cloud adoption for e-government services strategies in Ethiopia. Arends et al. (2014) suggested that as a part of the participant's recruitment process, I considered the characteristics of the study, the characteristics of the study population, the willingness of the participants to participate, the workload of participants, context, and the characteristics of the participants. Before the recruitment process begins, I established the participants' eligibility criteria for this single case study.

The recruitment criteria of semistructured interviewees was to include managers (a) who work for an organization that adopted cloud computing for e-government services, (b) who have a comprehensive knowledge of ICT and cloud, (c) who have a position with responsibility for and a say in e-government services strategies, (e) who were willing to participate in an audio-recorded semistructured interview process, and (f)

who were willing to allow me to publish my collected data in the dissertation paper. I recruited the expert managers from the organization, who implemented cloud computing for e-government services. I obtained all necessary documents such as 2015/2016 yearly reports together with Sabre technology solution and Microsoft Azure publication documents from the same organization to be able to validate the data that I had collected. Yin (2018) suggested that the participants should bring a degree of information from their unified experience. For instance, the selection of participants was focused on the combination of managers and decision-makers from the selected organization who implemented the cloud for e-government services. Based on these criteria, I used a purposeful, non-probabilistic sampling technique to invite 12 expert managers where the data saturation occurred from a governmental organization in Ethiopia.

Participation. As a qualitative researcher, I worked with the targeted organization managers who were decision-makers to negotiate, establish, and maintain access to participants (Peticca-Harris, DeGama, & Elias, 2016). Peticca-Harris et al. (2016) suggested that having access to the participants can be likened to a dynamic game, so the researchers are required to exhibit balance and flexibility. They also recommended developing three ways of gaining access to participants, which were (a) identifying someone the researcher already knows, (b) approaching an informant, and (c) determining an informant through a gatekeeper. For this study, I used a gatekeeper to access the participants. I believe that maintaining and developing trust with gatekeepers was a pivotal strategy to have access to the organization and research participants.

Based on the above recommendations and suggestions, I planned to pursue the following strategies and to build a working relationship with the targeted participants. First, I traveled from the USA to Ethiopia to meet the Minister of Transportation so that I could ask for her guidance regarding which governmental organizations in Ethiopia have trusted and adopted cloud computing for e-government services. Based on her recommendations, I communicated with the selected organization's Vice-President of Human Resources about the purpose and objectives of this study. After a long discussion in which I explained the premise of the study, the Vice President formally agreed to allow me to conduct the study and issued a letter of cooperation for Institutional Review Board (IRB). Second, I created a single point of contact or gatekeeper from the organization to determine the demography information (name, phone number, and email of participants) and related documents in cloud computing as well as e-government service adoption strategies. I also collected 2015/2016 annual reports that the organization had issued, Sabre technology solutions, Ascend, and Microsoft Azure publication for document analysis. I decided to collect these documents as each of them discussed how the organization had overcome their initial misgivings to trust and adopt cloud computing for their services. They were, as such, important resources with which I was able to verify the importance of the data that I had collected through my interviews with participants. Then, I set up a schedule for the interviews with details of place and time, as well as formulating a method by which I could receive feedback from participants after having shared the collected data.

I requested that the participants commit to having one private face-to-face interview that was scheduled to last between 30 to 60 minutes at the participants' organization audiovisual studio. The location was coordinated before the interview to ensure privacy during the interview. I used the organization's audiovisual studio to ensure the clarity of the sound on the recordings. Then, I requested each participant explicitly signal their agreement to participate in this study; I sent each one of them a consent form by e-mail that they needed to sign and returned to me before being interviewed. I explicitly sought consent from the participants before audio-recording their interviews for transcription afterward. I also took notes during the interview. I invited the participant to share their organizational policies, procedures, internal memos, program proposals, organizational reports, and other outputs of the actions related to strategies to lead cloud-based services successfully. I met each participant a second time, two weeks after their first interview, for 15 minutes so that they could review and validate the completeness and accuracy of the themes and study outcomes that I had formulated on the basis of their interviews. Since the second meeting was for the purposes of member checking rather than recording, and the member checking session was conducted at the participant's worksite. We agreed on location in advance of the member checking session to ensure that we had privacy.

To establish a working relationship with research participants, Leedy and Ormrod (2015) recommended finding a suitable location, obtaining written consent, and create and maintain rapport. They also recommend building trust to underpin effective communication and to provide adequate time to review material and make an informed

choice (Leedy & Ormrod, 2015). Based on these recommendations, I had established and maintained rapport with key contacts, as well as each participant, and obtained email confirmation from each participant through an informed consent form. For each participant, I had conveyed the benefit and purpose of this study, disclosed the procedures that protect their anonymity, required 30 to 60 minutes of their time for the semistructured interview, and accepted the participant who agreed and signed the consent form. I assigned numbers and letters as codes to make sure the participants' confidentiality was protected during and after the analysis of the data. Finally, I kept all the data in a safe place and protected the participants' rights.

Data collection. In response to the research questions, appropriate data were collected from the selected participants and analyzed regarding how a governmental organization in Ethiopia overcame the factors that adversely influenced managers of other organizations to the extent that they distrusted and decided against adopting cloud computing for e-government services. I started the data collection process as soon as I had received the final IRB approval from Walden University. After gaining their agreement and explicit confirmation of their willingness for this study to conduct the research, I obtained an approved letter of cooperation from the selected organization. I sent an approved letter of cooperation to Walden University IRB to receive final approval to conduct the study. Then, I (a) worked with the authorized manager in the organization to identify the potential participants who were a manager in the organization; (b) sent a recruitment letter to each managers who participated in this study along with a consent form; (c) follow up with a phone call to each potential participant to ask for their

participation and answered any concerns they may have; (d) explained the goal of the interview, obtained his/her permission, scheduled an appointment, and agreed on the site where the interview should took place; (e) started the semistructured interview starting with an introduction of myself, and the research topic as well as creating a bond with participant; (f) presented the recording devices such as smart phone, Sony recorder and scribe-writing folders such as OneNote; (g) started the interview with open-ended questions and follow the steps as per interview protocol (Appendix A); (h) reviewed the questions, follow up with clarification as required, and summarize each answer for clarity; (i) maintained confidentiality throughout the interview; (j) encouraged the participants to respond to the questions freely and comfortably; (k) finally, acknowledged the participants for their effort to answer the questions and taking the time participating in this study.

In collecting the right data, Friedrich-Baasner et al. (2018) proposed that semistructured interviews could be the right instrument to obtain the quality data that can match with the coding scheme generated from the existing environment or factors and examine the unknown effects at present. The possible types of qualitative data to address the proposed research questions included: (a) audio recordings and transcripts from semistructured or in-depth interviews, (b) semistructured observation on project been implemented, project team behavior, and project team interaction, (c) project documents (meeting notes, e-mails, reports), and photographs (Marshall & Rossman, 2015). The primary technique for a qualitative single case study was asking questions of research participants. In this research, I collecting the data myself by using a semistructured

interview technique to provide a deeper understanding of how a governmental organization in Ethiopia overcame the factors that adversely influenced managers of other organizations to the extent that they distrusted and decided against adopting cloud computing for e-government services.

Several researchers agreed that interviews allow a researcher to obtain a guided conversation (Dolci, Macada, & Grant, 2014; Sutherland, 2016; Yin, 2014). I collected documents from the organization, managers, and project remnants was a part of the interview process. Yin (2018) also discussed the types of case study interviews, which are shorter, prolonged case study, and survey interviews. Among those three interviews, prolonged case study interviews enabled a researcher for this study to interview flexibly; therefore, the data collection activities happened over an extended period and in several settings. Other researchers also agreed that an extended or prolonged case study interview supports a researcher to share meanings with participants (Nguyen, 2015). For this study, I chose prolonged case study interviews to collect appropriate data over the other two types of interviews, so I obtained an in-depth insight related to cloud computing adoption for e-government services from key informants in two settings. The first setting was 30 to 60 minutes for the semistructured interview, and a second set was for up to 15 minutes for a follow-up meeting with the participant to go over the interview results. To achieve high-quality results, I used diverse sources of data, such as audio recording devices, per participants' consent, to capture all conversations and collect different documents and reports on cloud adoption for e-government services strategies and plans.

The second sources of data were semistructured observations of the project implementation process, team behavior, and team interaction by attending mobile app development meetings, strategy meetings, and visiting the data center infrastructure sites. By conducting participant semistructured observation, I aimed to generate knowledge that was based on day-to-day activities. I approached the participants in their own environments and tried to learn how they overcame the challenges of working in the cloud as well as identified the specific contextual factors that impact their projects. I organized the notes based on their agendas and outcomes. The outcomes were organized as intended outcomes, observed outcomes, and notes on process and interaction. The agenda for the mobile app development project meeting consisted of online payment options, 11 current releases, and new mobile app releases. I used these field notes to validate the data that I collected during the semistructured interviews with the participants.

The third source of data was the organizational documents such as strategic plans, project documents, 2015/2016 annual reports, Sabre technology solution, and Microsoft Azure publication on cloud adoption for e-government services from the governing body of that organization. The documents, relevant to this study and directly related to cloud adoption projects, were acquired from the integrated marketing communication department. The collected organizational documents included (a) connect Africa to the future with Microsoft Azure, (b) mobile app publication, (c) Sabre passenger reservations technology solution, and (d) annual reports. The organizational published documents provided the details of the cloud adoption activities from the initial phase until the

completion. The project published documents consisted of details of the issues and challenges that had been encountered during the cloud adoption process. The acquired documents were used to validate the data collected during semistructured interviews. Consequently, to provide a deeper understanding of how a governmental organization in Ethiopia overcame the factors that adversely influenced managers of other organizations to the extent that they distrusted and decided against adopting cloud computing for e-government services.

Data Analysis Plan

Yin (2018) noted that the purpose of data analysis is to characterize, understand, and interpret the data, and then generate quality results. To answer the research question, I analyzed the data through a combination of multiple schemes, such as categorizing or grouping. Yin (2018) recommended the following data analysis steps to conduct qualitative research start with reading through all the data, compiling and organizing the data for analysis, beginning the detailed analysis using a coding scheme by disassembling the compiled data into fragments, reassembling the data into a sequence of themes or groups, and interpreting and developing meaningful data. I used the above steps for this study data analysis. Yin (2018) identified five specific data analysis techniques where a researcher can use in any combination of the five strategies: (a) matching patterns, (b) building explanations, (c) analysis of time series, (d) models' logic, and (e) synthesis of cross-case. A combination of matching patterns and contextual strategies was appropriate for this single case study. To conduct qualitative data analysis, I relied on the conceptual framework and research questions as well as the contextual research functions. In this

contextual research, I focused on explaining the phenomena, as experienced by the study population. I explored how those connected to understand the phenomena (i.e., cloud computing adoption for e-government services).

Until the end of the study, the process of data analysis was continued with the reoccurring process beginning with the data collection phase. I addressed the research questions and delivered responses to the interview questions by selecting the appropriate methodology for data analysis. To identify the factors regarding successful cloud computing adoption for e-government services by governmental organization's managers, I used multiple tools such as transcriber software, NVivo, Microsoft Word, and Excel to analyze the data I collected and generated comprehensive results. To support the plan, I used one of the research analysis strategies, triangulation, that involves several data sources to conclude (Davey, Davey, & Singh, 2015; Franco, Santos, Ramalho, & Numnes, 2014). In considering the four types of triangulation: data, investigator, theory, and methodological, I used methodological research to check out the consistency of results generated using multiple data collection methods, such as interviews, project document reviews, and semistructured observations. As some researchers noted, the use of a different source of data helps the researcher to strengthen the validity of a case (Carter, Bryant-Lukosius, DiCenso, Blythe, & Neville, 2014; Ravitch & Carl, 2015). In qualitative studies, to develop a comprehensive understanding of the phenomenon, methodological triangulation is a better triangulation in using technology to collect multiple data sources.

The advantage of using current technologies is the ability that provides user-friendly capabilities to a researcher to store and retrieve data (Khan, 2014). The other benefit of utilizing technology is the use of software tools and database management systems by incorporating the researcher's ability to analyze the data (Padgett, 2016). To generate associations and patterns, I used tools to analyze the data. The process of these patterns and relationships intertwines and allows the researcher to identify themes and subthemes, which help to answer the research questions (Smith & Nobel, 2014). There were several qualitative data analysis software programs available, such as NVivo, HyberResearch, and Ethnography, which researchers can use to analyze a given phenomenon, while the purpose of these programs was that they should be used as tools (Yin, 2018; Castleberry, 2014). As a researcher, I did take advantage of technology, including the ability to analyze collected data by using software tools and database management systems.

Most qualitative researchers use the latest version of NVivo software to manage and analyze data (Rodik & Primorac, 2015). The main reason for using data analysis tools such as NVivo software was to generate patterns and associations. The primary purpose of using NVivo software was to allow the researcher to manage data by coding, sorting, and organizing the data in themes (Sotiriadou, Brouwers, & Le, 2014). Based on literature reviews, it appears that NVivo software stands out among other quality data analysis software because it seems more intuitive, especially with features such as matrix coding, coding comparison queries, and text search. In this study, I used the latest version of NVivo software, which assisted this study by identifying and organizing themes from

qualitative data. Data analysis, in the context of qualitative research, is an iterative process through which researchers can refine their data as they collect more information. The decision to use iterative processes enabled me to sort the data effectively and to identify patterns and factors that recurred over the course of the interviews. As a result, the emerging patterns and themes answered this study research questions. The use of NVivo software replaced the manual data analysis by assisting in recording, indexing, storing, and sorting the collected data (Castleberry, 2014; Gould et al., 2015).

Once the program was up and running, I uploaded the interview transcript into the NVivo software to categorize, label, and identify common notions and themes. This process helped me to code the pattern themes and to visualize the stories that were being presented by the participants by employing inductive reasoning and exploring interrelated themes and subthemes. The application software-assisted this study with managing and organizing in such a way that I could visualize the relationships within the data; however, I still went ahead and analyzed the data outside of the program. As all of the participants spoke English as their second language, I used the Express Scribe foot pedal device. Doing so enabled me to transcribe the interviews from voice recordings directly on to Microsoft Word text and to then load them to NVivo so that I could subsequently identify and organize themes in the data. Those that recurred most frequently became the "themes" of this study, while those that occurred less frequently became the "subthemes" of the study.

I correlated the themes from the literature review, the conceptual framework, and the responses to the interview questions by thematic analysis. The thematic analysis is

used by researchers to identify, examine, and record meaningful themes within the data obtained (Teruel, Navarro, Gonzalez, Lopez-Jaquero, & Montero, 2016). The meaningful themes and subthemes generated by NVivo software was then be mapped directly to the conceptual framework that grounds this study, which was the TOE framework. The researchers were also used thematic analysis to designate how a theme can be formed from subthemes (Pascoal, Naciso, & Pereira, 2014). As a result, I linked the results of this study with academic literature, the DOI theory, and the TOE conceptual framework. In the process of identifying the themes, the researcher must make sure that the themes relate and directly address the research questions (Braun, Clarke, & Terry, 2014). The goal was to identify themes from the participants' responses that could provide insights into the perceptions of how a governmental organization in Ethiopia overcame the factors that adversely influenced managers of other organizations to the extent that they distrusted and decided against adopting cloud computing for e-government services.

Issues of Trustworthiness

For any study to gain acceptance into the pantheon of knowledge, the researcher must establish trustworthiness and acceptance by creating criteria to safeguard the reliability and validity of the research (Nummela, Saarenketo, Jokela, & Loane, 2014). In establishing issues of trustworthiness, Lincoln and Guba (1985) present several criteria and techniques (see Table 4). In a qualitative study, a researcher is a key instrument or medium through which data can be obtained. Because of that, bias can adversely affect the quality of data collection, which the researcher needs to minimize by introducing criteria and strategies (Frankfort-Nachmias, Nachmias, & DeWaard, 2015; Leedy &

Ormrod, 2015). I improved the trustworthiness of this study by capturing the data from face-to-face semistructured interviews and document reviews, such as reports, strategic plans, and organizational models, along with semistructured observation while rejecting other views, biases, and motivations. Some researchers agreed that there are no global standards that evaluate the trustworthiness of qualitative studies (Noble & Smith, 2015). I maintained control and followed the proposed criteria to ensure the trustworthiness of this study. I also took the necessary steps to analyze the collected data for credibility, transferability, dependability, and confirmability.

Table 4

Criteria and Techniques for Establishing Trustworthiness

Criteria	Techniques
Credibility	Prolonged engagement
	Persistent observation
	Triangulation
	Negative case analysis
	Peer debriefing
	Member check
	Referential adequacy & Reflexive journal
Transferability	Thick description
	Reflexive journal
Dependability	Audit (examining the process of inquiry)
	Overlap method (i.e., triangulation of methods)
	Reflexive journal
Confirmability	Auditing and attesting findings and interpretations supported by data
	Reflexive journal

Source: (Lincoln & Guba, 1985)

Credibility

The primary factor in ensuring the trustworthiness of this study was credibility. Credibility correspondence to internal validity and refers to the consistency and stability

of the data. Richardson (2014) indicated that credibility could strengthen using different methods as a valid means to collect and explore data. In the research study, credibility begins with the participants' trust in this study. Yin (2018) noted that integrating adequate operational measures in a study helps to maintain credibility. To strengthen the internal validity of this single case study, I integrated operational measures to eliminate alternate explanations and identified false relationships. Cope (2014) theorized that to increase the credibility of the study, the researcher needs to have the ability to recount the experiences accurately and authenticate research. I also had triangulation, member checking, and peer review. The researcher's ability to build a bond with the participants of a study and analyze precise data strengthened the credibility of the study (Cope, 2014; Yin, 2018). To enhance the credibility, I conducted a peer review and sought expert advice for correct interpretation of the research data. Nummela et al. (2014) suggested that once the researcher collects feedback from the participants, researchers should make a follow-up call to appraise the intended meaning of the participants' responses.

The researcher also needs to read the transcript thoroughly to establish credibility (Cope, 2014; Teusner, 2015). To gain an in-depth insight and completeness of this study and its context, I combined multiple approaches to collect accurate data. For instance, member checking is one of the most used strategies to ensure credibility (Fusch & Ness, 2015). I used member checking, cross-checking, data saturation, and triangulation to increase the credibility of the study. I collected data from semistructured interviews and document reviews, such as reports, plans, organizational models, and strategies, along with semistructured observation on project implementation to confirm results from each

source perspective. The goal of the semistructured interview was to reflect their perception of how a governmental organization in Ethiopia overcame the factors that adversely influenced managers of other organizations to the extent that they distrusted and decided against adopting cloud computing for e-government services, as well as to identify the factors that hinder or facilitate the cloud-adoption process.

In parallel, I collected reports and strategic plans related to the organization's cloud adoption for e-government strategies and contrast their consistency with the data from the interviews. I conducted semistructured observations with the selected participants to gauge how they interact with the cloud once it has been implemented, team behavior, and team interaction for data triangulation. Using Fusch and Ness' (2015) defined three steps to conduct member checking, I (a) thoroughly read and interpreted the interview transcript, (b) wrote and printed a copy of the synthesis to the participants, and (c) cross-checked with the participants to make sure the synthesis represents their answers. I continued seeking additional information until there was no new data to collect.

Transferability

The results of this study could be transferable to both governmental and private organizations in Ethiopia. The applicability of one study's result in another study is called transferability (Cope, 2014). Transferability is a process of validity focused on the importance of transferring results outside the boundaries of a study. Effective researchers use procedures to make sure information is accurate for credibility, which is needed to persuade the participants to answer the interview questions with a focused and rich

explanation to ensure transferability (Erlingsson & Brysiewicz, 2013). As a researcher, I provided enough details and took adequate measures to ensure the result of this study can foster future research within the same field and environment.

In qualitative case study research, Venkatesh, Brown, and Bala (2013) noted that transferability is the generalization of the research results to other similar organizations and a function of other researchers. In a comparable setting, transferability indicated that the results of this study could apply to another research. The sample size for a qualitative case study uses small samples as compared to quantitative studies; therefore, the use of a small sample size could skew the transferability of the results (Yin, 2018).

Transferability was critical for this study, as the results could be beneficial to the governmental organizations in Ethiopia and other developing countries. Merriam and Tisdell (2016) recommended that the researcher need to determine transferability by comparing the results and methods of the research project. In this single case study, transferability was possible as the focus was on cloud adoption for e-government services for governmental organizations in Ethiopia. Silverman (2016) also encouraged researchers to take care to ensure that they understand their research results and methodology. I provided full descriptions that helped future researchers to understand how a governmental organization in Ethiopia overcame the factors that adversely influenced managers of other organizations to the extent that they distrusted and decided against adopting cloud computing for e-government services and making informed decisions regarding transferability.

Dependability

To establish dependability, I incorporated the process of triangulation, first-round for data collection and second round for validation, multiple iterations of coding and analysis, and the process of member checking, as well as thematizing data. The primary source of data for this study was face-to-face semistructured interviews, the secondary data source was that of semistructured observation, and the third data source was that of organizational documents. In this study, I cross-verified the results against both primary and secondary sources of data and used a follow-up questionnaire to validate the results. I preserved the objective of the study by using follow-up questions and involving the participants in the member-checking process, as well as in the data validation process.

Confirmability

Confirmability refers to the researcher's ability to confirm or indicate the actual research data collected as the original interpretation of the study participants without biases (Teusner, 2015). Teusner (2015) noted that the researchers must make a significant effort to listen to each interviewee and record their insights, thoughts, and biases. A tool that helps researchers to strengthen the construct validity of their case study is triangulation (Yin, 2014). Teusner (2015) indicated that researchers use data saturation to strengthen conformability. As discussed earlier in this chapter, I used methodological triangulation, which involved a range of data collection techniques, data saturation, a literature review, and member-checking to ensure the confirmation of study findings.

Ethical Procedures

The authenticity of the research data solely depends on the autonomy of research participants (Musoba et al., 2014). What constitutes the foundation of a qualitative study was the voluntary expert participants (Padgett, 2016). To fulfill the requirements of ethics, Bryman (2012) specified four key issues that the researcher needs to address: (a) deception, (b) informed consent, (c) harm to participants, and (d) an invasion of privacy. The researcher should submit and obtain a consent form to indicate the willingness of the participant to voluntarily contribute to the study (Taylor et al., 2015).

The Belmont Report (1978) stressed that any research that includes human subjects should be conducted after the participant accepts the consent and is satisfied with the study presented. Based on the Belmont Report, there are three informed consent processes: (a) information, (b) comprehension, and (c) voluntariness. The information part of the consent process includes informing the research procedure, its purpose, and its anticipated benefits and risks, providing a statement to the participants inviting them to ask questions, and allowing the participants to withdraw at any time, as defined in the Belmont Report. In this single case study, one of the critical tasks to meet the requirement of an ethical standard was to obtain informed consent. I informed participants about the ramifications of their full, willing participation in this study.

Silverman (2016) indicated that researchers argued that participants should be aware of their rights in withdrawing from the interview at any time and understanding how the researcher protects their identity and the data they provide. Silverman (2016) also noted that the participant needs to understand how the researcher uses their data and

their rights regarding how they exit from signed consent. In addressing this issue, I provided participants with a consent form. The consent form included detailed information on the purpose and nature of the study, how I protected their privacy or confidentiality, their right to withdraw from the study at any time by expressing either orally or in writing without any negative consequences, and the participant and the responsibilities during the study. The consent form included Walden University IRB approval.

I also ensured that the participants met the minimum requirements and that they were 18 years of age or older. The interview process was not started until I obtained the approval from the Walden University IRB (approval number 10-04-19-0351257). Once I received approval from the IRB, I provided adequate information and time to the participants, so that they had plenty of time to reach an informed decision as to whether they wished to take part in this study or not. Killawi et al. (2014) noted that the researcher must protect the participant's information to ensure that their data is safeguarded to ensure confidentiality.

Other researchers also suggested that the researcher must preserve the confidentiality of participants' information so that their personal details do not become available in the public domain (Holloway & Galvin, 2016). I ensured that the participants' information was safeguarded by storing their data on secured cloud storage platforms such as OneDrive and Dropbox in accounts to which only I had access so as to ensure confidentiality. A participant's willingness and contributions to a study can only be achieved when a researcher assures them of confidentiality (Huang, O'Connor, Ke, &

Lee, 2016). To ensure this confidentiality, I used a coding scheme in place of the actual participant's name. I also maintained all the raw data, including audio recordings, notes, transcripts, and reflective notes in a safe place for at least five years. After five years from the date of this study published, I will destroy all the data by erasing the audio records, deleting all electronic files, and shredding all hard copies that contain interview transcripts, notes, and documents.

Marshall and Rossman (2015) argued that the summary of the data interpretation should be checked with member checking for validation from study participants. For reliable and robust data collection, I used member-checking by sharing the summary of the interview with the participants for their validation of the data collected. Other researchers also suggested the use of member-checking for verification of the interview summary by the study participants (Malagon-Maldonado, 2014). I also made sure and requested the participants' affirmation, that the identified and organized themes represented their responses. Some researchers also used member-checking to obtain the acceptance, use, and influence of professional audio during their study (Wang et al., 2014). In this study, I used a professional recording application on Apple iPhone 11 Pro Max smartphone and Sony professional recorder with a built-in application as a backup. I exercised impartiality, protected the expert participants' identities, and kept all the data confidential to ensure the integrity of the study.

To engender additional confidence in a study's validity, Yin (2018) detailed four types of triangulation, which are (a) data triangulation, (b) investigator triangulation, (c) theory triangulation, and (d) methodological triangulation. Data triangulation uses

multiple data sources, such as interviews, observations, and analysis of organizational documents. Investigator triangulation uses different evaluators to review the collected data. Theory triangulation uses various viewpoints to analyze the same dataset. Methodological triangulation uses a different approach to develop a phenomenon from various data sources. For the case study, the use of various data sources helped to strengthen the validity of the study (Ravitch & Carl, 2015). Some researchers define the process and use of methodological triangulation using various data sources, including (a) reflexive notes, (b) semistructured interviews, and (c) analysis of several documents to develop phenomena.

For this study, I used methodological triangulation by collecting data from semistructured interviews, semistructured observations, and analysis of organizational documents. The organizational documents included the organization's strategies for cloud adoption for e-government services, plans within the organization, and the organization's reports on ICT strategies. A semistructured observation with participants included the observation of the project that has been implemented, the project team behavior, and the project team interaction (Appendix C). These three different sources of data helped to triangulate the data to strengthen the validity of the data that come from the same organization as the interviewees.

Summary

In Chapter 3, I included a discussion of the research design, methodology, and rationale for choosing a qualitative single case study design. The objective of this qualitative, holistic, single case study was to provide a deeper understanding of how a

governmental organization in Ethiopia overcame the factors that adversely influenced managers of other organizations to the extent that they distrusted and decided against adopting cloud computing for e-government services. In this study, I analyzed the negative factors that could lead managers not to trust cloud computing adoption, which may help managers in governmental organizations to improve their e-government services to its customers. I included the action I took to validate the issue of the trustworthiness of the collected data as well as the steps I took to recruit participants, the data collection methods, the data analysis plan, and to protect the identity of the participants and their data. In this chapter, I included a discussion of the importance of ethics as well as defining the ethical procedures I used before, during, and after the semistructured interviews, while following IRB guidelines. After collecting, transcribing, and analyzing the data, I presented the results in Chapter 4.

Chapter 4: Results

In this chapter, I provide a comprehensive analysis of the data collection and the results of this study. The general research problem was how to overcome factors that cause most of managers at governmental organizations in developing countries such as Ethiopia to be reluctant to trust and adopt cloud computing for e-government services, especially while some managers of a governmental organization overcame this lack of trust. The specific research problem that I sought to address in this study was why managers of a governmental organization in Ethiopia ultimately chose to trust and adopt cloud computing for e-government services, despite their initial uncertainty or misgivings regarding security and privacy. The purpose of this study was to provide a deeper understanding of how a governmental organization in Ethiopia overcame the factors that adversely influenced managers of other organizations to the extent that they distrusted and decided against adopting cloud computing for e-government services. The intention of using a qualitative research methodology was to conduct an in-depth single case study, using subjective information and describing a complex phenomenon while providing participants' case information (Rahman, 2017). The results of this study provided information with which I could answer the following research questions. The overarching general research question that drove this study was:

> RQ: How had a governmental organization in Ethiopia overcome the factors that adversely influenced managers of other organizations to the extent that they distrusted and decided against adopting cloud computing for e-government services?

The following research subquestions led to the answering of the overarching general research question by managers who trust cloud computing for the implementation of e-government services in Ethiopia. The research subquestions were:

RSQ1: What negative factors had influenced the managers of a governmental organization in Ethiopia to distrust cloud computing for e-government services?

RSQ2: How have the managers of a governmental organization in Ethiopia dealt with both positive and negative key factors relating to keeping the organization's information safe, especially their critical data?

In this chapter, I provide a detailed description of participant selection and recruitment, data collection and analysis, and the evidence of trustworthiness. I include the results of the data analysis that align with the research questions. I also include a summary of thematized organizational, technological, and environmental factors, organized into categories in this chapter.

Research Setting

The research setting for the study was a governmental organization in the Democratic Republic of Ethiopia. The purpose of this research study was to provide a deeper understanding of how a governmental organization in Ethiopia overcame those factors that adversely influenced managers of other organizations to the extent that they distrusted and decided against adopting cloud computing for e-government services. The environment in the organization was ideal, as the study took place in the environment in which different functional areas were involved in the cloud adoption process.

This study was timely, as the organization leaders wanted to know how their cloud adoption process improved the rate of success in delivering effective services. Leaders and departmental managers from different functional areas in the organization provided their support while I was conducting the research. I used the organization's audiovisual room, which had soundproof settings, to conduct the interviews. All the participants had an association with this organization and were part of the cloud adoption process. I communicated with the participants by telephone, briefed them about the research requirements, and followed up with an e-mail that included an attached consent form and interview schedule options. Upon confirmation from the participants, I scheduled the interviews. All the participants met the purposeful selection criteria. The interviews took place inside the audiovisual room; the participants and I had privately agreed upon an interview schedule during working hours. While undertaking the research, I was not aware of any external or internal factors that could impact the interview environment or the participants themselves.

Demographics

All the participants were from one organization in Ethiopia. The participant selection process was influenced by different functional areas, as highlighted in Table 2 and included the purposeful sampling criteria. Within each functional area, I targeted a variety of experts to identify volunteers who had adequate knowledge and experience on cloud adoption for e-government services. Three major cloud adoption projects (e-visa, mobile app, and web-based applications such as passenger-reservations and revenue-management systems, consumer travel, a corporate booking tool, low-fare search

capabilities) served as primary sources of data for this study. I recruited participants who were involved in cloud adoption major projects. Based on the research proposal, I selected 12 participants from various functional areas, as shown in Table 3. The hierarchical levels represented included executive managers, directors, and managers. The CEO was not available for the interview due to heavy workload and frequent trips outside the country. Still, the remaining executive managers participated in the semistructured face-to-face interviews and member checking. In this study, data saturation occurred after eight interviews, and subsequent participants provided no new information; however, the interview process continued with the remaining four participants to reinforce the data collection and findings.

Data Collection

The cloud adoption for e-government services comprises a sequence of activities involving various departments in the organization. Each function plays an essential role in the cloud adoption process for e-government services, as highlighted in Table 3. To explore how a governmental organization in Ethiopia overcame the factors that adversely influence managers of other organizations to the extent that they distrust and decide against adopting cloud computing for e-government services, participant selection involved individuals from several departments, as it was crucial to understand the perceptions of staff from all the relevant functional units.

The data collection process took place in November 2019, and involved face-to-face interviews with 12 participants, semistructured observation, as well as the collection of various organizational documents for three major projects. An interview guide that

included semistructured interview questions directed the interview process. I developed a consent form for recruiting participants via e-mail. The consent form went to the IRB for approval before I commenced the data collection process. Participant contact occurred via e-mails and phone calls. All participants consented to participate in the study via e-mail.

All the interviews took place over 20 days; I scheduled participants for back-to-back interviews to ensure the timely completion of the data collection process. The schedule for the interviews took place at the participants' convenience; three participants scheduled the interview to take place after their working hours. The interviews took place in an audiovisual room within the organization. At the outset of each interview, I verbally explained the rights of the participants, along with the details of the study, to ensure the participants had a thorough understanding of their rights, the process, and the importance of their contribution to the study. I also explained to the interviewees that they would receive a transcript of the interview for member checking and that a follow-up questionnaire would require their feedback to validate the findings.

I personally conducted the interviews in order to gather data; these lasted between 30 and 60 minutes. The interviews took place based on the guidelines recommended by Yin (2013). The interviews were primarily audio-recorded using TapMedia Pro-audio recording software for mobile phones. I used a mobile phone as the audio-recording instrument, as the microphone of a mobile phone can intercept audio using high-quality hardware and software. To avoid technical difficulties or software or hardware malfunctions during the interview, I simultaneously recorded the interviews using a Sony

sound recorder device. All interview recordings had high definition audio quality, which assisted in the transcribing process.

I transcribed the interview by using professional audio, video, business, graphics, and dictation software. However, as many of the different types of voice recognition and transcribing software were not able to provide accurate results because of the variation in the non-native English language accent, I used a traditional playback and typing approach. I transcribed the interviews in Microsoft Word and reviewed each interview two times to correct any errors and to maintain a high level of accuracy during the transcription process. After transcribing the interviews, I contacted the participants with the printed copy of the transcripts at their convenience regarding time and place and asked them to review the transcripts. All participants confirmed the recorded data without any modifications and returned the transcripts with the acknowledgments. The member-checking process did not take more than 10 minutes for each participant.

A secondary source of data was a semistructured observation, a method that I undertook by attending project meetings, visiting their on-premises data center infrastructure, and demonstrating the use of cloud computing. The first observation was at the departmental weekly application development meeting. The meeting started with the project manager providing a brief overview of the status of the project that mainly focused on the new version of mobile app development. The project manager presented the vision and mission of the project to the team of managers, team leaders, and developers. The vision was to make the mobile app a contactless experience in the cloud for its customers. One way in which they sought to overcome the negative factors that

affect managers' decisions as to whether or not to adopt the cloud was to develop the mobile app by benchmarking other similar organizations globally. They organized their mobile development by staging several releases and highlighting multiple features in each release to make their clients' cloud computing experiences feel easy and more rewarding.

In one of the meetings, the project manager's intended outcome was to secure approval for current online payment options such as Airplay, JCB, M-Birr, and push notification features from the management team so the development team could proceed with the development of applications on Microsoft Azure. The observed outcome was strong support from the management team but a need for more clarification about the pros and cons of each feature. The notes on the process and the interaction of the team were that high levels of professionalism were displayed and that there was strong support from the management team to build flawless mobile apps for their clients through Microsoft Azure. Attending this meeting helped to provide more data on how a governmental organization in Ethiopia overcame the factors that adversely influenced managers of other organizations to the extent that they distrusted and decided against adopting cloud computing for e-government services. I also visited their state of the art on-premises data center that was a challenge for them to abandon in order to migrate their data from their local servers to cloud servers. While visiting their on-premises infrastructure, I was able to see their interaction with cloud servers that host the top two projects: mobile app and web-based applications.

The third source of data was the organizational documents that I had acquired from the integrated marketing communication department, which included project published documents. The collected organizational documents included (a) connecting Africa to the future with Microsoft Azure, (b) mobile apps, (c) Sabre passenger reservations technology solution, and (d) annual reports. The project published documents provided the details of the cloud adoption activities from the initial phase until the completion. The project published documents consisted of details about the issues and challenges that had been encountered during the cloud adoption process. The data from the published documents contained time-stamped events and details of the tasks that had been assigned to various departments. Each functional department updated the published documents with the status and issues during the implementation phase. The published documents assisted in the triangulation process by validating the findings of the data from the interview against the recorded events.

Data Analysis

In this qualitative, single case study research design, an appropriate process for data analysis is methodological triangulation (Fusch & Ness, 2015). I used methodological triangulation, started with semistructured interviews as primary data, semistructured observation, and organizational documentation as secondary data for triangulation. Researchers indicated that qualitative researchers ought to use methodological triangulation to enhance the quality of data that was collected from multiple sources such as interviews, observation, and organizational documents (Carter et al., 2014; Morse & McEvoy, 2014). Data analysis is defined as being the combination of

several schemes, such as categorizing or grouping, to help answer the research question (Yin, 2017). For qualitative research, Yin (2017) recommended six data analysis steps (a) read through all the data; (b) by organizing and compiling, make the data ready for analysis; (c) to begin detailed analysis using a coding scheme, disassemble the compiled data into fragmented; (d) reassemble the data into themes or sequence of groups; (e) interpret the meaning of themes; and (f) develop the meaning of data or an interpretation. I used this data analysis approach for this study. Silverman (2016) stated that the data analysis process is a continuous and reoccurring process commencing with the data collection phase until the end of the study.

The use of methodological triangulation enhanced the credibility of this study and helped to achieve data saturation. The sources of data for this methodological triangulation were (a) semistructured interviews, (b) semistructured observations, and (c) organizational documents. The organizational documents, including (a) connect Africa to the future with Microsoft Azure, (b) mobile app, (c) Sabre passenger reservations technology solution, and (d) annual reports. I generated 21 themes and four subthemes that reflected cloud adoption strategies used by the organization by analyzing semistructured interviews and validated with semistructured observation, and the four organizational documents collected from the same organization.

Innovative technologies such as research software have user-friendly capabilities to store and retrieve data (Khan, 2014). Researchers can increase their ability to analyze collected data by taking advantage of technologies such as software tools and database management systems (Padgett, 2016). Researchers use data analysis tools to generate

associations and patterns which lead to themes and subthemes that help to answer the research questions (Smith & Nobel, 2014). Rodik and Primorac (2015) suggested that researchers can use the quality data analysis (QDA) software tools such as NVivo to manage data, analyze data, and aid in (a) coding, (b) sorting, and (c) organizing the data in themes. I downloaded the trial version of two QDA software tools (atlas.ti and NVivo) and tested them on the machine. Based on the testing, I found NVivo to be a lot more powerful than atlas.ti with features such as (a) matrix coding, (b) text search, and (c) coding comparison queries. I analyzed the data using NVivo 12 Plus and used the same software to store, manage, code, and analyze the data collected from semistructured interviews by implementing inductive reasoning and exploring interrelated themes and subthemes.

A qualitative thematic analysis was suitable for analyzing the interviews with 12 participants. Researchers can correlate the conceptual framework and the themes of the literature using thematic analysis to (a) identity, (b) examine, and (c) record meaningful themes within the data collected (Teruel et al., 2016). I used the NVivo 12 Plus software thematic analysis functionality to categorize data into significant themes. The thematic analysis involves looking and searching into data in depth to reflect the main ideas and conclusions that were found in the data collected. In addressing the research questions and purpose of the study, the research design was vital, given that it enabled this study to examine the participants' firsthand perceptions and experiences to discover the negative factors that have been associated with managers distrusting and deciding against adopting cloud computing for e-government services. The themes from the qualitative thematic

analysis helped to answer the primary research and research subquestions because of the most meaningful parts of the responses by the participants, aligned with semistructured observation and organizational documents. I generated patterns of the responses of the participants, identified the essence of the perceptions and experiences of the participants, and organized them to establish various themes.

In addition to using NVivo 12 plus software, I followed Yin's six steps of completing a thematic analysis. As Jason and Glenwick (2016) noted, the first step was the immersion in the data process, starting with an initial review of the collected data in preparation for labeling the data with codes that helped in preparing for the next stages. The second step engaged was generating the initial codes in which I took notes of the listed codes and units that helped to build answers to the research questions. The third step involved searching for themes, which included organizing and identifying the codes that had been formed and assigned in the previous step to determine the patterns from the participants' responses. Then, I established themes directly after I conducted a closer examination of the patterns. I eliminated the themes that seemed to be irrelevant to the study. The fourth step involved reviewing the analysis of the formed themes from the interview responses and organizational documents that included cross-checking all the data to see if I coded all the themes that related to the study and to determine if any themes were missing. The fifth step involved naming and defining themes and included the recognition of the relationships of the themes, which led to further identifying and the naming of themes. After naming the themes, their meaning became more apparent, and the clustering of data again took place. The sixth step involved organizing and reporting

the data findings, which I presented in the next section in more detail, with the most occurrences being presented as themes and the least occurrences as subthemes of the study.

In order to devise thematic categories of study from the data, I carefully considered the participants' responses to the interview questions that were generated based on the research questions, starting with research subquestions. I summarized the result in the context of the overarching general research question. I divided the first research subquestion into three categories: (a) negative technological factors, that I further divided into two themes and two subthemes; (b) negative organizational factors, that I further divided into five themes, and (c) negative environmental factors, which I divided into two themes. I allocated just one category to the second research subquestion: (d) process keeping the organization information safe, which I then divided into four themes. Finally, I divided the overarching general research question into two categories: (e) overcoming the negative factors part I, to which I linked three themes and (f) overcoming the negative factors part II, which I divided into five themes and two subthemes.

Evidence of Trustworthiness

This qualitative, single case study involved testing the analyzed data for credibility, transferability, dependability, and confirmability. The process of testing the credibility of this research study involved that by making sure the subject of the research, as well as the truthfulness of the results, consistently emulated the negative factors that affect the managers not to trust and adopt cloud computing for e-government services in

Ethiopia. The member-checking process helped in validating the authenticity of the collected responses of the participants by having them review their responses and to clarify, correct, or explain their answers where needed. The transferability of data was the second qualitative characteristic found in this study. The descriptions that were provided by the 12 participants were comprehensive and meaningful as a result of the audio recordings, transcriptions, and noted from interviews. The interpretation and content of the interviews obtained from the actual responses of the data collected, and the established findings were impartial and unbiased; reflexivity occurred. The dependability and confirmability of the data were ensured by the systematic and careful collection of the organization of the interviews.

Credibility

Credibility emanates from the trust that the participants have in the research study and noted that credibility stems from a series of activities (Venkatesh et al., 2013). In this study, the use of member checking, cross-checking, and triangulation ensured credibility. The process included accurately transcribing interviews using various passes and confirming the truthfulness of the data collected by performing member checks with the participants to validate the data captured. Simpson and Quigley (2016) stated that the habit of asking participants to verify the transcript of an interview advances credibility to the study. As a part of member-checking, I provided the transcripts of the recorded interviews with the participants to them for their confirmation and validation. Taylor et al. (2015) recommended that participants should be allowed to check the interview summary to use it as a tool for ensuring credibility and confidence. During the member-

checking process, all participants indicated no change. The commonalities across all three major project findings helped achieve data saturation along with validated and confirmed results. While I was coding the transcript and organizational documents, cross-checking with participants had taken place. The cohesion in the themes that appeared from the interview data across all cloud adoption projects, the semistructured observation, and the supporting organizational documents also helped in triangulating the findings. Across the data sources, the triangulation of data from interviews, semistructured observation, and organizational documents assisted in evaluating and validating the results. There was no deviation between the anticipated credibility and the final credibility of the study.

Transferability

In a qualitative case study, transferability is a function of this study for other researchers, and the generalization of the research findings to similar organizations (Venkatesh et al., 2013). The findings could be transferable not only within the country but also in other similar developing countries. Yin (2017) stated that in a case study, researchers use small sample sizes, such as 12, that were used for this study, instead of a generalization. The fact that the data came from one organization in Ethiopia and the sample size involved only 12 participants, and it could be difficult to transfer the data. Merriam (2014) contended that by comparing the methods and findings, determining the compatibility of research projects is a good practice.

Dependability

Dependability means that the qualitative single case study must be capable of being repeated (Malagon-Maldonado, 2014). Incorporating the process of member

checking and thematizing data, the process of triangulation, two rounds of data collection and validation, and several iterations of coding and analysis ensured the data were dependable. Padgett (2016) asserted that dependability is a comprehensive implementation of the qualitative research study. The primary source of data was face-to-face interviews, and the secondary sources of data were semistructured observation and organizational documents. This study involved the participants in the member-checking process and that data validation process, and cross-verifying the findings against all sources of data. In the process, the participants did not have any changes to the summaries of the interpretation of their interview.

Confirmability

Confirmability is the degree to which another researcher can validate the findings of qualitative research (Venkatesh et al., 2013). In the process, when a researcher receives verification and validation of the research findings is confirmability (Padgett, 2016). During the interview process, bracketing the experience and background established confirmability. To eliminate the chance of influencing the participants, I avoided providing any feedback during the face-to-face interview. Since the participant selection process involved a purposeful sampling strategy and the interview guide included semistructured interview questions, the participants were fully aware of the phenomenon under study and did not require any clarification on the interview question.

This situation also helped to restrict the feedback during the interview process. In establishing the confirmability of the study, memberchecking also assisted. The use of reflexivity and methodological triangulation as a strategy is highly recommended for

confirming the results of a qualitative research case study (Chan, Walker, & Alan, 2015; Ravitch & Carl, 2015). To improve the confirmability of the data, I used Word documents during the transcription of the collected data from the interviews. I provided the transcripts Word documents to the participants for their review and confirmation. All 12 participants confirmed and acknowledged the transcripts without any changes to the data. The member checking process also improved the confirmability of the data. I used reflexivity and methodological triangulation methods to strengthen the validity and confirmability of this case study.

Study Results

Upon the completion of the thematic analysis of the data collected from all major cloud adoption projects, 21 themes and four subthemes emerged that all addressed the central and research subquestions. I used the overarching and two research subquestions to address the main ideas and queries related to the overarching general research questions. This section includes the developed themes along with precise text to support the perceptions and experiences of the participants. The overarching general research question that drove this study was: how a governmental organization in Ethiopia overcame the factors that adversely influenced managers of other organizations to the extent that they distrusted and decided against adopting cloud computing for e-government services? The interview questions lead managers, who trusted cloud computing and supported the implementation of e-government services in Ethiopia, to provide answers to the overarching general research question and sub research questions.

Leading Technologies Used by the Organization

When designing the interview questions for participants, I wanted to ensure that the participants' responses to the first interview question would provide me with a deeper understanding of which type of technologies the organization was using when they overcame the negative factors. The factors that adversely influenced managers of other organizations to the extent that they distrust and decide against adopting cloud computing for e-government services. In the section below, I present the details of the technologies that are currently used by the governmental organization in Ethiopia before presenting the themes and subthemes that I identified based on the participants' responses to the interview questions that were designed based on the research questions. Based on the participants' responses to the interview questions, all the participants discussed that the organization was using Microsoft Azure, Amazon web services (AWS), and Sabre technology solutions as their primary cloud technology providers. The products delivered by their service providers are mobile app and web-based applications in the cloud, at the time of the interview. Participant 01 (IMCT) shared that they have a mobile and cloud-first strategy, and the technology they chose was based on their clients' demand and the suitability for a particular action.

> We have this mobile and cloud-first strategy. So, the technologies we choose based on our client's demand and based on the suitability for a particular action. We may be on Amazon for some of the services or on Microsoft Azure for other services. Cloud is there, that is technology. In the cloud, we are not seeking only hosting, but we also do this continuous development, integration, and deployment

> because agility is the driver. As a business, a bit of business and technology, the single driver is agility. When you do the structure of the company, when you do processes, when you choose technology, agility is there. So, we choose cloud, and from the cloud, platform as a service, that will give us continuous development and deployment, specifically the microservices from the cloud services. The distributed technology, where we can develop test and deploy simple services, we call them API first. We're saying API first as a strategy. So whenever you have a business function, we think about how we can convert it to an API and ship it.

Participant 02 (DSADT) explained that, currently, they are using various technologies related to the cloud. The primary computational services they are getting from the cloud services are server desk computing and workload management.

> Other technologies include cloud database, Devo solutions for development and operations, storage services offered by the cloud, virtual machines, and keywords for storing passwords. These are the most popular products we are currently using. We have mobile applications, which are distributed by Google and Apple stores. This is what the clients interact with, and they are hosted by the cloud, including the backing and the support for online reservation and booking. We also have microservice solutions. They are platforms serviced by third parties that facilitate microservice architecture, where mini services and standalone solutions can be deployed and maintained independently. Since we have more significant applications, having one minority application is not ideal in terms of management, approach, and maintenance, so we have this microservice architecture and

> application services that are standalone. We have a solution offered by our cloud provider for supporting these types of applications. We are currently using Microsoft Azure. We are also using Amazon Web Services (AWS), but not as much as we are moving over to Microsoft Azure. We are doing this because it has tight integration with our development platform, and we have excellent support and relationships with Microsoft moving forward.

Participant 03 (ICT-ADDT) explained that the current trend of ICT in their organization is divided into two teams (a) technical team and (b) transformation team.

> Currently, as I told you earlier, there are technical teams in our section, and there is a transformation team. So, the technical team adapts technologies. We are using Microsoft technologies such as web API and programming languages called C Sharp. So, we are utilizing the latest technologies, including J Sharp and likes. So, as soon as the technologies are available, there is a dedicated innovation team who discover if there is anything new on the technology side. Once the technical team discovers the latest technology, they will demonstrate that to the team so that we can adapt that technology to our internal technology system. The technologies include but not limited to API, C Sharp, J Sharp, etc.
>
> The primary responsibility for the business transformation team is adapting or creating a new business innovation. For example, maybe some other managers told you that we started online, using a mobile app. We began to issue vouchers to the passengers electronically. Previously, we are using hard copy vouchers for transit passengers when they arrive at the airport inside a transit office. So, there

> was a long queue when they try to obtain a voucher to stay in Addis. But now, using our mobile application, we automatically issue for all transit passengers a voucher so that they can go directly to the hotels. Our business transformation team creates such kind of business innovations. Regarding the development, there is also business intelligence. We are currently using SAP business intelligence tools; we develop an executive dashboard for AI management to make real-time decisions. They know the number of passengers they are carrying in real-time. They will be notified if there are delayed flights, which are affected for four months. And how many transit passengers are there, they all have dashboards to see all the activities of the organization.

Participant 04 (DPT) explained that the current trend of ICT in their organization is that there is a need for developmental and technological advancement in the context of the cloud services. The participant also discussed all their application infrastructure for the business-critical systems are in the cloud.

> We are also working on business intelligence analytics and predictive analytics technologies that are going to mobile-first adoption technologies. Also, from the strategic point of view, when we develop all the systems on the mobile phone and it should also work on the desktop. The other major product is big data, where we have been working some part of it regarding data consumption of machines such as our aircraft, analyzing and generating some output. We are also working on obtaining analytics, big data, and business intelligence technology for mobile use.

Participant 05 (EMT) explained that the system they use from Sabre technology solution is one of the most important current trends in ICT for their organization. Sabre technology solution is the heart of the entire passenger management system.

> As you know, when customers want to fly with us, the first thing they do is search. They want to see our schedule, available seats, prices, and everything. So, that system is the back-end that manages that data. It pushes them to different sales platforms and, when bookings are made, it accepts and stores it, so modifications needed can be done. And, on the day of departure, the entire process is starting from check-in to boarding and things to do with baggage are also handled. So the main passenger management process is accomplished using the cloud system. It is hosted, currently, in the US on two data centers.

Participant 06 (BADT) shared that Microsft Azure has become the most standard cloud-based platform for its organization and is used more than any other cloud-based platform. The current platforms which are trending in ICT in their organization are asp.net, microsof.net corp, and zamarin.

> The leading technologies we are using Amazon Web Services, Sabre, but Microsoft products as a standard in our organization. For instance, to develop mobile applications, we are using zamarin forms. This is a technology used in mobile app development by Microsoft. To develop web applications, we are also using another Microsoft product called asp.net. We were using the asp.net framework. We are not using this anymore. We already moved over to Microsoft .net corps. That is the trend. We are already moving over from the asp.net

> framework over to asp.net corps because the world is moving towards open-source platforms and they want their web applications to be cross-platform. Asp.net framework is actually only for .net environments. It cannot be compiled with other operating systems like Linux and others. However, with .net corps, it is possible for it to be compiled and dockerized into other operating systems and can run smoothly in other IT systems. So, we adopted asp.net corps and we are working on that one for our web applications. Zamarin is actually a cross-platform product as well. So this is all for developing in the house but still hosted in Microsoft Azure. Actually, when we are hosting them, some of the applications we are developing, most of the time, the applications which are customer-facing are being deployed in Azure. If the applications are internally used in our organization, the applications are hosted on-premises in our data centers.

Participant 07 (ICT-SOM) explained that the current trend of ICT in their organization is the use of virtualization and convergence. They are using the virtualization technology not only in the cloud but also on-premises.

> We always go to virtualization. We use one host for one service. We need to virtualize; we are doing that, so virtualizing technologies are being implemented on on-premises. And then, convergence. We are converging the storage to compute the storage and also the network together. Which means, it is creating a cloud box, on own premises cloud box. However, we use cloud services to manage our IT services. For IT services, we are using the process of incident management, problem management, and event management. We are using the

> Zoho desk application that is running in the cloud. To manage our infrastructure, especially the server infrastructure, the data center, again, we use Zoho 24/7. It is also a product of Zoho. For IT management, we are now using the cloud platform as a service and software as a service.

Participant 08 (TDCT) explained that the current trend of ICT in their organization is an entirely Microsoft-based product except for Oracle. The leading technologies that they used are Microsoft Azure servers and Oracle.

> For application-level work, we use C sharp. This is what we are working on locally with the services that we host here. There are other services that we host on Azure. The mobile app uses a microservice hosted on Azure to host mobile APIs. The UI development, the mobile app uses Xamarin.forms for web-based forms. For web-based systems, we use Angular, jQuery, and Bootstrap. These are the technologies that we adopt from the cloud. There are other programs we use on a smaller scale, but these are the leading technologies that we use. For the front end of the web-based applications for the UI, we are using jQuery, Bootstrap, and AngularJS. Currently, we moved from the .net platform towards a faster and more intuitive platform called .net core. This is the latest Microsoft offering. We are migrating from .net to .net core. Today, our organization is running most of our applications through .net core.

Participant 09 (SOCT) explained from a security perspective that the current trend of ICT in their organization is Fayo, Mailgated, Splunk, Foreword plus, and other intrusion prevention tools.

From a security perspective, we follow the principle of defense because it is a strategy from different companies. We are now; the Fayo is our first line of defense. After Fayo, we have Mailgated protection. The web protection and endpoint protection tools. In addition, we are currently implementing a security incident and event management tool, which is the popular tool of Splunk. Splunk is a tool which is used to analyze different types of human, readable log files, so it generates a security trade and security information. Anything on the network, we can see through this tool. So, we have such kinds of security tools. These tools, we support or monitor them daily so we can get a security log file. With the Splunk tools, we manage and protect our network. On the first line of defense, we took the Fireword plus; actually, we have the IPS, intrusion prevention tool so that we can see any attack and any plantation testing through these tools. The country, the origin, and destination, the IP address, the source of information. All such kinds of things will be managed through these tools. An option to this one, we consume the low file of this security tool, and we make analyses and investigations. Finally, we make the correlation from different security and we produce a use case. So, what are the touchpoints? What is the purpose of this security attack? Is it related to personal attacking personal information? We take all security tools to create a correlation event and we decide to block or to allow any traffic.

Participant 10 (ICT-SOM) explained that the current trends in their organization are hybrid systems. They have a private cloud called Vblock that provides a system that can be used by IT users or non-IT users to access resources by just clicking simple buttons.

> We have the capability of using the Vblock to provide the private cloud here. We also focused on virtualization. We used to have dedicated servers for all applications where we identified major gaps, resource underutilization, various hardware maintenance, energy, UPS, and other shortcomings of the physical machines. We had these challenges to tackle, so we went for the virtualization in a complete manner. Now, we are currently VMware virtualization and the HyperV from Microsoft. The VMware platform seems to take the lion's share because we have different features from this virtualization. Also**,** as a strategy, we are currently working on our end-user device design and deliverability on the media solutions so that we make sure all the marketing, sales, and others have the media solutions to use. For the call center last year, we went for a cloud solution called Genesys PureCloud, where we used IPCC (IP contact center) from Huawei but owned by Ethio Telecom. With the current system, we do not have much flexibility to add options. If we need one, we must wait for a very long time. We then decided to pursue cloud solutions for the call center, where we get different features. It is not an application; rather, it is a platform. It gives us different opportunities. These are the main ICT solutions we are using. We also have some Amazon servers in the cloud, but the major focus is on Microsoft Azure. This covers the major ICT trends.

Participant 11 (SAM) explained the leading technologies they are using on-premises today and in the cloud. The participant indicated that they have a state-of-the-art data center that serves both within the organization and its clients.

> On-premises, we have state-of-the-art data center equipment. We try to see how the world is moving, what are the driving factors, who is leading now, and what product they have. Mostly, that will be the responsibility of the design and delivery section. So, we have Vblock, which is state-of-the-art hyper-converged infrastructure. Vblock is on-premises, and it is a server, network, and storage. It is put into one system. And, it is tightly coupled. They are highly integrated within themselves to get the maximum out of the system. We also use SAP for ERP logistics. We use Microsoft Exchange, both on-premises and in the cloud. We have a hybrid infrastructure and a hybrid deployment. We have on-premises users and we have cloud users. Both platforms are used for our organization's users. The main reason why we use a hybrid system is that we have offices all over the world. And, instead of having the users come all the way here, they go to the nearest cloud server. The other product we have is Lido. Lido is basically used for route management, let's say. When an airplane departs from Addis Ababa to IAD, what is the best route? What is the most efficient route? This is to add on top of what other managers explained to you.

Participant 12 (ICT-IDDT) explained that their current trend of ICT in their organization includes both on-premises platforms and those in the cloud. On-premises, the participant shared that the organization uses Dell AMC technology and Cisco products for their

entire infrastructure. For cloud applications, their organization uses Microsoft Azure as its prime cloud computing platform.

> It is a private cloud-ready infrastructure that we have in our environment. We have already offered private cloud services for our on-station users like providing Microsoft online, staff ticketing. These are the services that we are providing to our offices. From a network perspective, we are fully Cisco technology. The latest technology includes a firewall, distribution switches, and access switches as well. At the end-user devices, we are using HP and Lenovo for laptops. These are the basic technologies that we are using for the end-user and network and server infrastructure perspective. In the cloud infrastructure application, we are using Exchange 2016. Office 365 is used onsite and for employees, we are also using for outstation users. We have more than 300 employees out of Ethiopia. For those users, we are using Office 365. Why are we doing that? As I said, connectivity is a big issue since we are trying to mitigate those issues by providing different kinds of technologies like MPLS. However, this does not warrant us to not offer an easily accessible environment for end-users. Therefore, we prefer to move to Office 365, a specific source deployed for employees.

Answering the Research Questions

In formulating the results of this study, I ensured that they addressed each research question. To present these results, I organized the findings by research questions as well as by themes and subthemes. So as to afford the reader with the clearest understanding possible of the results, I discussed the participants' responses to the constituent research subquestions first before considering the overarching research question. Beneath each research subquestion below, I have provided details of the participants' responses to supports my brief explanation of the themes and subthemes.

Research subquestion 1

RSQ1: What negative factors have adversely influenced the managers of a governmental organization in Ethiopia to distrust the use of cloud computing for e-government services?

This question was about the negative factors that were categorized into three groups, such as the environmental, the technological, and the organizational, as associated with the cloud adoption for e-government services. The results are listed in the order of significance. Under the first research subquestion, nine themes and two subthemes developed that addressed sub research question 1. The complete results are listed in Table 5.

Table 5

Breakdown of the Results Addressing Research Subquestion 1

Category	Themes/**s**ubthemes	n
A. Technological negative factors	A-1: Protecting the privacy and security of the clients' data	8
	A-1.1: Lack of accessibility to data and confidentiality	3
	A-1.2: Taking a risk	2
	A-2: The cost of ownership	2
B. Organizational negative factors	B-1: Perceived as exporting jobs and losing their jobs	4
	B-2: Not engaging stakeholders at the beginning	2
	B-3: The culture of leadership in setting the tone	2
	B-4: Resistance from other organizations	2
	B-5: Learning curve and open mindset	1
C. Environmental negative factors	C-1: Lack of understanding and resistance to change	2
	C-2: External pressure due to lack of local infrastructure	2
	Total	30

Thematic Category A: Technological factors. The first thematic category A is the technological factors that affect the managers not to trust and adopt cloud computing for e-government services. This thematic category has the following themes: protecting the privacy and security of the clients' data, lack of understanding and resistance to change, availability of local infrastructure, and trust with cloud service providers. Based on the interviewed participants, the most significant negative factor was the concern of protecting the privacy and security of the organization's information as well as their clients' data.

Theme A-1: Protecting the privacy and security of client's data. The first theme that emerged as a negative technological factor is the concern of protecting the privacy of

the customers. Based on the participants' responses to the interview questions, taking data outside the organization's premises, and sharing it with a multi-tenant environment created significant security concerns. Among several negative factors, privacy was one of the critical obstacles to the adoption of cloud computing for e-government services. Participant 01 (IMCT) shared that the confidentiality of customers and the availability of the system were a critical factor for trusting and adopting cloud computing for e-government services.

> The privacy of customers and also the availability of the system are essential. The thought in management has been pushing better to locate all the data and also the process in the house because they are concern about certain things those buzz words in the cloud, security, and privacy. So, people are not restricted to make sort of applications in house. But, we were making all in the house or on the premises because we didn't have these public-facing applications. We did have only these business-to-business (B2B) applications. For B2B, the thing is most of the customers are here in Addis, the users are here, and the business is here. So, for privacy reasons, we don't have to make things in the cloud. When we are moving to global business, then we do have all the offices across the globe; the challenge became's response time and availability of the infrastructure from Ethio Telecom and all the rest. Despite the concern on the privacy of the customers, the cost of managing our data center becomes very high. This situation and other factors were driving us to move to the cloud. So, the organization forced to balance between the exitance of our business in the market versus security. So,

> what we have said, we should invest a lot in security in terms of technology, people, and process.

Participant 02 (DSADT) explained that data ownership and privacy concerns were one of the major technological negative factors. The main challenges in moving to the cloud from a technological perspective were from the reason of data ownership and privacy.

> This is one of the main reasons. Many people think that going to the cloud will increase exposure to security threats and breaches; this is the other factor. In my experience, the management must buy into the idea of digitalization and must believe in digitalization and its IT department. Enabling the IT department will eliminate confusion around the cloud. If more IT developers develop experience around the cloud, most of this confusion can be tackled, in my understanding.

Participant 03 (ICT-ADDT) indicated that migrating from on-premises to the cloud was not an issue. Even with security issues, we have our private cloud within the Microsoft cloud, which is administered by their system administrator team. However, the privacy of the customers' data was a concern.

> In my opinion, I do not think that there were technological factors that affect cloud migration. The cloud has most of the features we require. It contains the database, hosting the whole infrastructure. All features are available in the cloud, even with the security features we have on on-premises also available in the cloud. Most people think that the cloud is open for everyone and it is not secure. But currently, in our organization, we have our private cloud from Microsoft as our on-premises data center. That private cloud is administered by our system

> administrator, even if it is located outside the country. We have our username and password. The system administrators have their username and password. The developers have their own username and password, so everybody will be authenticated to access the cloud resources which help us to protect the privacy of our customers. For us, cloud computing is as good as on-premises infrastructure. However, before releasing the mobile app to the cloud, there was a privacy issue. One of the major concerns was the personal data of the passengers should not be distributed to third parties without the consent of the passengers. So, for that, we have a dedicated quality assurance and security team that assesses any application before we release it in the cloud.

Participant 05 (EMT) explained that the trend in IT had the data center, and the data itself near us makes us believe that it is safe. However, moving the data from their local server to a cloud server creates a major concern in securing the organization and its clients' data.

> Starting from the first time when you have your data center or data near you, believing that it will be more secure was the trend. So, we had to wait together with other players for the adoption. Because do I trust my service provider to apply the kind of security requirement that I do in my internal data center? How reliable is their process? And so on. So, as time goes on, these providers also came with their different certifications and insurances, and when others started to adopt them, we said: "look, in any case, we are all in the same business." If others put their trust, we should also do so, and we moved on. But mainly, it was a security concern.

Participant 07 (ICT-SOM) explained that the mentality of believing on-premises gives them more security than storing data in the cloud played a significant part as a negative factor to trust and adopt cloud services.

> Even though they are not the majority, some people think the cloud is not secure. It is obvious; I do not have a more secure environment than the cloud. However, there is a strong belief that on-premises are more secure than the cloud. Technically, if you see it, I do not have better technology on-premises than in the cloud. I do not have better professionals than in the cloud. It is obvious; the world has more professional than our organization. So, whatever technology we implement with regards to security, it is always better in the cloud. Unfortunately, some people resist going to the cloud. However, I do not believe that it was a challenge. In our case, it is a governmental business organization, and we do not have such a secure data structure. The only thing that we are concerned about was whether those data would go to our competitors or not because we do not want our data and our business's secrets to go to our competitors easily. So, we decide to do an NDA (Non-Disclosure Agreement) with the service providers. We need to trust them, of course, but we also need to have them sign the legal document. It is trusting what matters in cloud adoption, but also, we need to have some control over the system with a legal agreement.

Participant 09 (SOCT) discussed some of the negative technological factors, which are the privacy and security of the organization as well as the client's data. The participant's

major concern was about the possibility of conflict between the countries that provide and that use the services.

> During the adoption process, the negative impact was the possibility of losing data due to the conflict between the client's country and the hosting country. The clients have a concern about where their data is stored. For instance, our data is in the cloud (let us assume it is in Dubai), so if there is a conflict between Dubai and Ethiopia, there is a fear of not getting our data. This is fear. The other thing is, the national policy, also, which type of data will be stored in the cloud is the question of different kinds of organizations. Is it possible to store our data in the cloud that the national policy supports this one? This one is not clearly defined. The other thing is the fear of the unknown. People or organizations, if they do not have a clue about cloud services, there is a fear of the unknown. So, it may be a challenge for them regarding the cloud. If they have the opportunity or a consultant who can support them and who can share the best practices and the benefits of having the cloud service, we moved to the cloud. But, from my understanding, the fear of the unknown presents a challenge to the policy, is that possible through the cloud? If there are some challenges or conflicts between countries, is it possible to get the data? That is the question of organizations.

Participant 11 (Team Leader) explained that the number one question or negative factor was the protection of our organization's and clients' data. As the participant stated, they were reluctant to trust and adopt cloud computing for e-government services.

> The first one is obvious, data security. So, we were a bit reluctant at first. Since you do not see your data, you are not in control of your data. But our drivers are our customers. We have customers all over the world. And, the infrastructure that we have now, we have on-premises and qualify for that kind of load. So, per our customer's demand, we decided that we need a cloud infrastructure that will be beneficial to our goal and which will be easily accessible by our customers. That was the strategy. And, the basic question is how. How can we trust the data we have? How can we know that we are in control of it? How can we know that it will not be shared with other people? Those kinds of questions created a negative factor that prevents managers from trusting and adopting cloud computing for our services.

Participant 12 (ICT-IDDT) explained that the management team was not concerned with IaaS. However, when it comes to platforms as a service and SaaS, the management was very concerned with the privacy and security of confidential data.

> Honestly, as I said, the first adoption for Our organization was for infrastructure as a service, which was fully managed in-house. In that perspective, we do not have such kind of impact or environmental effect. However, when you come to platforms and software as a service, the big concern is the security of confidential data. For example, when you assess security, we are saying how they are doing the security mechanism to secure our environment, which we were already putting all their services. The other one was confidentiality of the data because when we put our application or data into the cloud, it is accessible for the service provider.

> That was a big concern for management to push the application to the cloud, even to acquire cloud services.

Subtheme A-1.1: Lack of data accessibility and confidentiality. The first subtheme that emerged as a technological factor is the lack of accessibility and confidentiality to the database or the servers directly for administrative purposes and confidentiality. Participant 05 (EMT) stated that data accessibility was a negative technological factor in adopting cloud computing for e-government services.

> The negative factors that were circulating among the management team were, how long do I want to retain my data there? How do I get these things wiped and how do I get confirmation? These sorts of things over the years, we had to adjust our contractual terms with our provider to be more in our favor in terms of giving us more flexibility. Putting them mainly as a platform provider, in the initial phase, those were the challenges that generate negative factors. At first, our understanding was cloud computing could limit our ability to do certain things because we do not have access to the database or the servers directly for administrative purposes. Also, there was a certain dependency on which we take what they can do in terms of the patch file, handoffs, and other such kinds. However, over the years, that has matured and now we have more visibility. Our system admins can also access remotely and collaborate with the on-site team to do more things. So that came with a maturity of the cloud environment. The capability now can be extended. We can choose how we do our process independently from the other tenants that may reside in that environment. So,

> more customized services can be arranged now, but initially, there was some drawback or limitation that we used to face.

Participant 10 (ICT-SOM) discussed the challenges of lack of data accessibility and the support behind the platform. At first, it seems unease to move the system from on-premises to cloud and access the content through a third-party network and server.

> When the network is outsourced and relies on reliable internet connectivity, we need to rely on the internet service provider and the cloud service provider. Just a day before, we ran into an issue on one of our systems called Genesys PureCloud. This is a system that does not work about 0.01% of the time. This resulted in an operational downtime of 40 minutes with our call center. Such unavailability arouses fear towards the cloud as we sacrifice total control of our operations when we rely in the cloud. The system is based out of Frankfurt, Germany. They had an issue that their development team was addressing, but we did not get an in-depth report yet. We have a meeting next Wednesday to go over their backup plan. We also need to go over why this happened. On the communication channel, we use Twilio for call collection; it is a big platform.

Participant 12 (ICT-IDDT) explained that there are two major disadvantages or negative technological factors that prevented managers from trusting and adopting cloud technology, at least for some time.

> There are two disadvantages to the cloud; one is data confidentiality. That is the big one. For example, we are using MR (mixed reality) applications for our very critical aircraft. We put all the historical data on the airplane there. We are using a

> chrome management system that has all the information. For that kind of application, we are not willing to move to the cloud due to the sensitive nature of this kind of data. The other issue is internet connectivity. These are the two basic disadvantages that we can assume when putting applications to the cloud or acquiring cloud services.

Subtheme A-1.2: Taking a risk. The second subtheme that emerged as a technological factor was taking a risk in trusting and adopting cloud computing. Based on the participants' responses to the interview questions, almost all the participants stated that they do not want to take a risk by becoming the first to trust and adopt cloud computing for e-government services. Participant 01 (IMCT) stated that to meet their 15-year vision, they have set a goal that to purchase or adopt new technology that is used by the best similar organization in the world rather than taking the risk of adopting cloud computing.

> We have a solid process. First, we do RFI (Request for Information) to all service providers. The industry is somehow open and highly monopoly business. So, for example, for one vertical, there are only two or three providers. We ask the list of providers to visit us and to present what they have. The typical question that we always ask is, “Who is using this product?” We compare. We have been saying that we have to be the best followers. We are not taking risks to begin to experiment, but, in our next vision, we are already meeting this vision 2025 so we are having a new vision called 2035. In 2035 vision, we are just starting the brainstorming and also environmental scanning to even be the first in some of the

> streams; in some of the areas. In that case, the organization will start the experiment and taking the risk of adopting without following other similar organizations. We will have a lab where we can call a university or start-ups to experiment on new ideas and new technologies like IoT, virtual reality, Artificial Intelligence (AI), into our business process. That is already there, but for now, to vision 2025, follow; bring the best products used by the best companies to minimize the risk. Otherwise, taking a risk was a negative factor for managers not to trust and adopt new technologies such as cloud adoption.

Participant 09 (SOCT) explained that their high-level management team is ready to take any risk with a strategy of moving to cloud computing services. However, the negative factor was the country's rules and regulations on the risk of taking their organization's and clients' data outside the country.

> Moving to the cloud was not a challenge for our high-level management team. I believe that our leaders are visionaries, and they have more experience from other similar organizations and how they work with cloud computing services. So, I don't think that the management will have a challenge with the strategy of moving to the cloud. But they may have a question to know the country's policy and procedure. Does it allow us to move the country's data to the cloud? This might be their question. But, moving to the cloud, they know it is a strategy to save cost, a strategy to do efficiently, and a strategy to compete with the industry.

Theme A-2: The cost of ownership. The second theme that emerged as a technological factor is the cost of ownership in trusting and adopting cloud computing for

e-government service. Participant 02 (IT manager) explained that the first technological negative factor was migration cost. Sometimes, migrating into the cloud has its own cost, and the other part was technological support.

> Traditionally, organizations use legacy systems, so migrating those legacy systems into the cloud was very challenging and needs a lot of high performing vendors. It was a big project, which makes it another issue. The other thing was exposure to security risks. Sometimes, users are internal in the form of company users. So overall, migrating into the public cloud increases exposure to security breaches. If this is carefully handled, this will not be a problem. As mentioned before, there are legacy and proprietary systems that cannot be easily moved into the cloud, so these were the negative factors. As of now, we are not yet ready to move these applications over to the cloud. Rather, for the new solutions, especially those related to customer-facing products, we will have more innovation and development. So, we are pushing these newer products and applications into the cloud.

Participant 03 (ICT-ADDT) stated that the most challenging part of migrating to the cloud was the cost of resource utilization. Multiple team members access the cloud, which generates more cost than the need.

> The major challenge that we are facing is the cloud resource utilization. So, as I mentioned to you, the developer's access to the cloud and other team members does also have access to the cloud. They will create multiple resources in the cloud that affect the effective use of the cloud. Due to the inefficient use of the

resources, multiple charges were coming. This is because of not knowing or not efficiently using cloud resources. So, this was the major challenge in adapting to the cloud.

Thematic Category B: Organizational negative factors. The second thematic category B is the negative organizational factors that affect the managers not to trust and adopt cloud computing for e-government services. The negative organizational factors were perceived as exporting jobs and loss of their jobs, not engaging the stakeholders at the beginning of the decision-making process, the culture of leadership in setting the tone, poor cooperation and resistance from other organizations, and learning curve and open mindset.

Theme B-1: Perceived as exporting jobs and loss of their jobs. The first theme that emerged as a negative organizational factor in the adoption of cloud computing was the perception that it would prompt the exporting of jobs from stakeholders' perspectives and a loss of (their) jobs from the employees' perspectives. Based on the participants' responses to the interview questions, the most important organizational negative factor that was perceived in relation to the adoption cloud was the exporting of jobs from the employer perspective or losing their jobs from the employee perspective. Despite the lack of local skilled manpower, most people perceived a move to the cloud as prompting the shipping out of jobs outside the country. Participant 05 (EMT) explained that, initially, they had heated discussion about trusting and adopting cloud computing until the management team fully understand the pros and cons of trusting and adopting cloud computing for e-government services.

> Initially, until something is fully understood, the pros and cons, we had debates and heated discussions. But, over the years, after we got over on those issues and people saw the stability and other added benefits of cloud computing, the negative factors started to go down. We now have no major opinion difference in our strategy in adopting the cloud. But, initially, yes, some could argue that this could be, you know, people see this from different angles. One funny thing I remember was, coming from or being located in a country where we have to create jobs, when you put something out there and somebody else, somewhere is going to do that for you. It is taken as exporting jobs or giving out opportunities. So, from a different political view of having more local people do things, it may sound different. But the driver cannot be that alone until you get these kinds of services being offered in the country. You can not stop taking advantage of that. So, we say there will come a time where these kinds of services will also be available locally. At that time, local talent could be more utilized. But, in the meant time, we argued, and we continue to trust and adopt cloud computing for e-government services.

Participant 07 (ICT-SOM) explained that the strategy to trust and adopt cloud computing for e-government service created negative organizational factors mainly from IT professionals who believe in the on-premises environment.

> The overwhelming feeling of concern was that the cloud is not secure. However, the situation was just an empty concern that was not supported by any evidence. It is just a feeling; it is very easy to explain to management and everyone else that

> the cloud is more secure than on-premises. Other than that, the management is only concerned with security, first, and then cost. Cost-wise, it is usually the case that cloud services are cheaper when you see the total cost of ownership. So, it is very easy to convince others in that way as well. However, there are some colleagues and IT professionals who believe in the on-premises environment. The reason being that they are afraid of losing their job. They believe joining the cloud is shipping out our jobs. That was the challenge from that side. Of course, that was the major challenge, in my view, which IT management needs to deal with. Otherwise, the other challenges are not as significant.

Participant 09 (SOCT) discussed that exposure to new technologies could minimize the fear of the unknown. The people who work on-premises tend to adopt new technologies than people who don't have exposure to new technologies.

> We, as people, tend to avoid the unknown. The curse of any user is that they have a fear of the unknown. So, how can I work in the cloud with the fear of the people in the organization? But if you have an experienced user on on-premises, I do not think that it would be as much of a challenge. But, if you do not have any systems or infrastructure before and you wanted to adopt cloud for your organization, and they command you to work in the cloud, they push back by asking several questions. They challenge you because there is a fear of the unknown. The other thing that I understood was some people, negatively, do not want to move to the cloud, and they do not want to accept the technology because they think that if we accept this new technology, they may fear for the loss of their job. So, such kind

> of thing was a challenge and a negative factor in trusting and adopting not only the cloud but also adopting new technologies. So, the fear of losing their job is what makes it a problem for the organization to adopt such types of technology.

Participant 10 (ICT-SOM) explained that the negative organizational factor was the staff's perception of the cloud. At any time, the management team brings the cloud adoption, the participant, and his team who are managing day-to-day operations of the on-premises data center are concerned about their job security.

> Whenever you propose a cloud solution, there are people such as myself or members of my team who are managing the day-to-day operations of the onsite data center infrastructure. Therefore, most of us fear this could replace our jobs. We need our staff to feel a sense of belonging to the company. Most of us indicated the day to day activity we have done, without focusing on the delivery, has a positive impact. For example, I may come in the morning and spend the whole day fixing a single server, and I feel like I am busy and contributing to the company. However, if you replace that server with cloud computing, and I am not doing the day-to-day upkeep of our infrastructure, then my importance to the company diminishes. This was a very difficult challenge for us because we tend to focus on our tasks rather than the core business

Theme B-2: Not engaging stakeholders at the beginning. The second theme that emerged as a negative organizational factor is the lack of engaging stakeholders at the beginning of the projects. Based on the interviewed participants, the most important organizational negative factor was the lack of senior users' participation in the decision-

making process at the beginning of the new technology adoption process. Participant 01 (IMCT) shared one of their failed projects from their previous experience of adopting new technology that was decided by the executive management team only.

> We had projects that failed. It failed; it is not because they are not meeting the schedule or the budget. Rather, the typical challenge was that executive-level management was not making the senior managers as a part of the decision-making process from the very beginning. They only involved the executives and the suppliers who are meeting to make the ultimate selection of the project. And the executives know that this product is going to change the organization because it aligns with the strategy of the company, but they have not seen how others have been utilizing to make their business more effective and efficient. The senior managers also joined the idea or to the accusation of new technology in the middle or at the last stage of the process. The senior managers know the pain; they know what kinds of potential problems that the new product could address from the very beginning. So, the engagement of stakeholders has been hindering the adoption of new technologies in most of the time, but now, that is not the case.

Participant 11 (SAM) indicated that when a person is getting used to something that makes them comfortable, as a human being, they do not want to accept new things or learn how to do things differently.

> The first thing is trying to teach our employees how to deal with the new environment and engage them as early as possible in the process. I believe that should come first. Getting accustomed to the environment is crucial. If the

> organization wants to go to the cloud, and it has been decided at the strategy level, the first thing that needs to happen is to communicate with stakeholders as early as possible. What the top leaders need to do is getting people accustomed to it so that when the change comes, we will not have that discomfort or that attitude "I may not be able to do it" kind of mentality. From a human perspective, that is it. Our organization is a bit different from how we are structured. As I said at a strategy level, when preparing these kinds of things, our CIO takes responsibility in convincing our group CEO and other board members as well. It did not take that long because of our driving factors. And, as I said, our driving factor is our customers.

Theme B-3: The culture of leadership in setting the tone. The third theme that emerged as a negative organizational factor is the culture of leadership in setting the tone at the upper level. Based on the participants' responses to the interview questions, the second most important organizational negative factor was the culture of leadership in setting the tone from top to bottom. Participant 01 (IMCT) explained that one of the negative factors we had was a leadership culture that does not set the tone at the top level. Previously, when people start projects at the lower level, the technology team has no power to move forward.

> Here, in our culture, if you set a tone at the leadership level, you are done. But, previously, when people start projects at the lower base, the technology team has no initiative. They go with what the vendors provide them. Then, engaging people for the training, and engaging people for the testing of the new system to validate

> has been very challenging. The upper management used to believe that ICT as a functional role with a focus on maintenance mentality. Introducing something valuable, such as cloud adoption, was impossible. So, what we have learned is that securing the sponsorship from the top was crucial for bringing ICT as one of a pillar at the organizational strategy. ICT becomes a driver to bring change to the organization. Now, it is everyone's DNA to be digitized, and it becomes a huge problem for most people to do things on paper because the management/ leadership has set the tone that everyone to go with digital. The way of life becomes digitally. The only way that we can survive in the market, to be cost-effective, and provide the passengers or customers a value proposition is to go paperless. That tone of leadership for every project and every initiative becomes mandatory.

Participant 02 (IT manager) indicated that the most negative factor from the organizational perspective was the concern about service disruption on the application that is running. The upper management sets the tone that makes sure that no interruptions occur during migration.

> From an organizational perspective, the organization wants the system of the applications to keep on running and they do not want any disruption on the applications. The other thing is the cost. Many believe having the application hosted in the cloud is costlier than hosting onsite. Those are the challenges, and there was also data ownership with conceptions, where upper management believes that having our databases hosted in the cloud will increase exposure, or

> the provider will have access to our data, our application, and services, so those are the challenges from the organizational perspective. To tackle this, we had various engagements with the provider, so there was a lot of training so we can clarify many misconceptions. As mentioned before, some confusion stems from a lack of knowledge and experience in this space. The other thing that helped was that we benchmarked other companies with similar business models pursuing a transition over into the cloud. We also did a cost-benefit analysis. These steps we took helped bring in a better understanding on behalf of upper management and the organization towards the cloud. This has been our journey of migrating to the cloud thus far.

Theme B-4: Poor cooperation and resistance from other organizations. The fourth theme that emerged as a negative organizational factor is poor coordination and resistance from other organizations that are under the same government. Based on the participants' responses to the interview questions, the third most important organizational negative factor was the resistance from other governmental organizations in Ethiopia. Ethiopian organization has been deploying services on cloud not only with other Ethiopian governmental organizations but also with other governmental organizations outside Ethiopia. Participant 03 (ICT-ADDT) explained that one of the negative factors we had was resistance from other organizations.

> For instance, developing e-visa had some resistance from the immigration organization side. As you are aware, we have developed an e-visa application. When we propose the solution to our CEO, he immediately accepted the solution

> because our cloud has a bigger platform that can hold such kinds of applications. However, the government agencies we partner with insisted that it is not proper to store such kinds of data into the cloud. Despite the organization's resistance, our upper management dedication with other organizations' management team helped to minimize the negative factor. For instance, our management team assured us that data security would be managed by our organization's teams only. Then, they agreed to proceed with that. That was the challenge that I remember we were facing when deploying e-visa to the cloud. Now, it is up and running. Once we pass the negative factors such as privacy and security of their client data, we have developed the application for Malawian, Chad, and other organizations in Africa.

Participant 08 (TDCT) stated that the only service provider in the country is not able to provide the required connectivity to access cloud computing services.

> One of the biggest problems is connectivity, which runs by another organization outside our organization. Before we moved to the cloud, all our services were here within our organization. It was easier for us to access locally. We did not need the help of the internet. Now that we are accessing the cloud systems that are hosted across the world, we need the internet to access and to change our services that are running over the cloud. Without high-end internet, there will always be that gap. This is one of the main challenges that we faced. For instance, we wrote this application that we wanted to publish, but the internet connectivity prevented us from doing so right away. We are talking about a 1 GB file or a 500 MB file

> here. We cannot publish this right away, so there is always this intermittent problem from this aspect. This is one of the biggest problems that we face.

Theme B-5: Learning curve and open mindset. The fifth theme that emerged as an organizational factor was the challenge of a learning curve from adopting new technologies. Participant 08 (TDCT) explained that there will always be a learning curve with using new technologies. The main problem that we always face with new technologies is the learning curve. Participant 11 (SAM) explained that the negative technological factors were the lack of open mindset and lack of training on getting accustomed to the cloud environment.

> In my case, you must teach stakeholders a whole different way in terms of how to manage the cloud environment instead of an on-premises environment. It is a whole different concept. On deployment, you can say there are technical difficulties, but that is on the design phase, and they will be sorted out with our vendors.

Thematic Category C: Environmental negative factors. The third thematic category C is the negative environmental factors that affect the managers not to trust and adopt cloud computing for e-government services. Based on the participants' responses to the interview questions, the most important themes were lack of understanding and resistance to change and external pressure due to a lack of local infrastructure

Theme C-1: Lack of understanding and resistance to change. The first theme that emerged as a negative environmental factor was the lack of understanding and exposure to the cloud environment. Participant 04 (DPT) explained that two major

negative factors affected them when they attempt to adopt cloud computing. The first one was a lack of understanding of how the cloud works, and the second one was the resistance to change. Participant 08 (TDCT) explained that the major obstacle to trust and adopt cloud service was the lack of understanding of the methods of using cloud services.

> The challenges were understanding the method of using the services. In the beginning, there is always a learning curve when it comes to new technologies. However, from what we saw, we are currently using Microsoft Azure, and it is not that difficult of a step to take because there are always differences with technologies. We host applications by owning the server. So, there are other ways of hosting Azure. You must learn that. To run background services here, we use windows services. When it comes to Azure, there are other web running background services like chrome, java, or worker services, so there is always that learning curve to build an understanding of the system.

Participant 10 (ICT-SOM) described the challenge of accepting new technologies due to cultural, political, and socio-economic factors. The most difficult part or negative factor from an environmental perspective was the resistance to change.

> It is always challenging when you want to adopt a new thing, whether it is because of culture or upbringing. It is difficult to accept new things, so it was very challenging for us to even think about the cloud. That situation created unexpected resistance. The issue is our internal environment. We had heavily invested in onsite data centers, such as Vblock, located in Tanzania. Having this investment and needing to go to the cloud, we thought it was a redundant

> investment given how heavily we invested in Vblock. The need to go to the cloud was another challenge. The other thing to consider was the cost. Most cloud solutions tend to utilize pay-as-you-go models, complicating the total cost of ownership. It seems that having an onsite infrastructure for the cost is better than the cloud when we started moving over to the cloud. The other thing is the privacy issue. Our organization manages large amounts of data. We feared the data would be exposed to a third party, which was another challenge.

Theme C-2: External pressure due to lack of local infrastructure. The second theme that emerged as a negative environmental factor was external pressure due to a lack of local infrastructures, such as internet connectivity to the world. Participant 07 (ICT-SOM) explained that a lack of stable connectivity played a major part as a negative factor to trust and adopt cloud services.

> To access cloud services, I need connectivity. In that way, I fully depend on the external organization, which is the only service provider in the country called Ethio Telecom. So, unless I have reliable connectivity, I cannot use the cloud. That was a major negative factor.

Participant 10 (ICT-SOM) described the challenge of accepting the new technologies due to the internet connectivity from the external organization and the only internet service provider (ISP) in Ethiopia.

> The first thing on the environmental side was the internet connectivity issue. Our organization has three means of connecting with the outside world. We use the internet from Ethio Telecom, the MPLS, and the VSAT. Even with three outlets,

we still run into some issues regarding internet connectivity. The challenge was the internet connectivity issue from Ethio Telecom. The internet service provider is an issue as there is only one provider.

Research Subquestion 2

RSQ2: How have the managers of a governmental organization in Ethiopia dealt with both positive and negative key factors of keeping the information of the organization safe, especially their critical information?

This question was about how the managers of governmental organizations in Ethiopia dealt with the service providers to mitigate the key factors in keeping the information of the organization safe, especially their critical information. This study was able to address RSQ2 by thematic category, which is the process of keeping the information of the organization safe. The results are listed in the order of significance. Under the process of keeping the information of the organization safe thematic category, four themes identified and addressed the process of linking with service providers. The complete results are listed in Table 6.

Table 6

Breakdown of the Results Addressing Research Subquestion 2

Category	Themes	*n*
D. Process of keeping the information safe	D-1: By creating a process from selection to hiring service providers	2
	D-2: By signing a legal binding agreement with service providers	3
	D-3: By creating a step-by-step approach to the cloud	1
	D-4: By identifying lead service providers and similar organizations	1
	Total	7

Thematic Category D: Process of keeping the information of the organization safe. To answer the RSQ2, the fourth thematic category D had four themes identified by the participants regarding how the organization dealt with the processes that were taken by managers linking with the service providers to have them maintain the privacy and security of their sensitive data, especially their critical information. The primary themes they indicated for solutions that apply to keep safe their critical information were by (a) creating a process from proposal to tender, (b) signing legal binding agreement with service providers, (c) creating a step-by-step approach to the cloud, and (d) identifying lead services providers and learn from a similar organization.

Theme D-1: By creating a process from selection to hiring service providers. Based on the participants' responses to the interview questions, one of the processes that were taken by managers to have the service providers maintain the privacy and security of the organization's sensitive data were by creating a solid process from the proposal to

tender with the service providers. Those solid processes include RFI and RFP process, contract negotiation, inserting crucial clauses in the contract, bringing consultants into the picture, service level agreements, and verifying with other similar organization on their experiences. Participant 01 (IMCT) shared their solid process by going through several steps that are involved before they select the best service provider for their front-end application.

> We have a solid process. First, we do RFI (Request for Information). The industry is somehow open and highly monopoly business. So, for example, for one vertical, there are only two or three providers. We ask the list of providers to visit us and to present what they have. The typical question that we always ask is, "Who is using this product?" We compare. For instance, a product might be used by a lot of similar organizations, but it may not tie to our business model. We look at similar organizations that are using the application business model. Is it similar to our own? We are a network head and we are global; we are leaders in Africa; we have diversified business units. Such kinds of strategical similarities in terms of business models. We assess that. So, if someone is using a business model that is similar to our own, we have been asking a lot of questions that we should ask now. We asked the service providers to allow us to visit one of their successful clients' or a kind of user who has been using their system. We have a project that represents executives who are sponsoring or funding this project. We, the IT specialists, are the suppliers, who are managing the project. This set of people are going to visit before we trust their services. Then we identify the list of service

> providers and issue RFP (request for proposal). After RFP, we go to the bid, and then we would be community-established from procurement, business, and the legal team. Then there is a negotiation team after the first bid. That is at the senior level. Then, we go through the process of acquiring the right service provider. This is the process we go through to make sure, initially, that we are only using the best products used by the best companies.

Participant 05 (EMT) explained that one of the processes of obtaining a reliable service provider was by putting a tender. In the selection process, they specify the specific requirements based on the kind of services they are demanding with the help of consultants.

> We will not be looking for the lowest possible cost. First, where we do not compromise is on the specifications. My service provider needs to fill this, this and this. And, we got them, of course, with help from advisors and consultants. They need to have these sorts of requirements when you select your cloud services. So, based on that, we float. Today, of course, we work with the big cloud service providers. We have a presence on AWS and Microsoft Azure. We will expand as the business grows. However, when we begin during contract negotiations, we ensured certain clauses are included that prevent the information of the organization from any attack. I mean, to build mutual trust, we put different liability terms. So, contract completeness is one thing we work on even using external advisors in terms of what should be included that will guarantee me access to my data and ensuring that my provider does that. And what if something

> happens? How do I make them liable? So, contractual negotiations are the first step. Then we do quarterly reviews as to what activities they have taken to ensure the continuation of the service. If they have any incidents, we get informed. We discuss, and we also evaluate their mitigation if that is enough or if we want them to do more. So, during these reviews, they will also inform us if they have done a new technology or something like that.

Theme D-2: By signing a legal binding agreement with service providers. Based on the participants' responses to the interview questions, one of the processes that were taken by managers was to have the service providers maintain the privacy and security of the organization, sensitive data had strong end-user agreements with service providers. Participant 08 (TDCT) shared one of their processes, which is to sign service level end-user agreements with the service provider.

> The service provider had service level, end-user agreements on what measures will be taken to ensure that the data is protected from outsiders. In the event of such things happening, who would be liable? Who would be responsible? All those things have been taken into consideration with the service level agreement. This is how they established trust with us. Currently, our service provider is Microsoft. Since they are our service providers, we have the agreements that I stated earlier. Microsoft is a bit complicated. The thing is, most of the technologies used in this country, as well as this company, were Microsoft-based, even before we moved to the cloud. It was to achieve that interoperability between different technologies. It is always easier for you to proceed with the

> current provider. There are years of business relations between the companies, resulting in trust that had slowly been built over the years. Potential interoperability issues were circumvented by keeping within the Microsoft suite of products.

Participant 10 (ICT-SOM) explained the legal binding process as a very challenging process, but this is the only way that the organization can trust and adopt cloud services from service providers.

> Our legal team has spent a lot of time in making sure the cloud service provider acted on our needs regarding our data so that they do not expose us or even look at our data. Solidifying these privacy terms was the major binding force for us. The other thing we did was to observe the best practices of other similar organizations. Sometimes, it is good to look at and emulate the successes of competitors. In our case, we looked at KLM, Lufthansa, Emirates, etc. We saw that many of their systems were hosted in the cloud, primarily Microsoft Azure. The third thing we have done was checking the reputation of the service provider, given the competitive nature of this space. You do not simply pursue cloud computing with any company as there are certain risks to migrating to the cloud. We also took into consideration the service provider's reputation. The other thing we have done is address privacy and data security with third party access beyond the cloud vendors. We have also studied their security model, where it can assure us that our data is safe.

Participant 11 (SAM) explained that to trust cloud computing providers to maintain the privacy and security of their sensitive data, they need to sign a non-disclosure agreement (NDA).

> So, to identify the right cloud service provider, we go off the Gartner report. We try to look at it to determine who will better meet our needs and to determine what we want to do. The first thing is, "what do we need to do?" We must know that. So, ours, we needed a mobile app and a website that will help us to reach our customers more. How it goes is, in any other project as well, you prepare a requirements document. You release an RFB (request for the bid), and you get the documents back and, as I am sure you know, you review the document and, if needed, you interview the qualifiers and then you decide what is best accustomed to you and your needs. We tried to see other similar organizations as well. We look at other teams. We observe how Emirates, Singapore, and other leading similar organizations perform with cloud technology in the market so that we can be a great follower, at least. After that process is complete, we must go through the contract very carefully. Then we prepare a legal contract and sign with our cloud providers to protect ourselves.

Theme D-3: By creating a step-by-step approach to the cloud. Based on the participants' responses to the interview questions, one of the processes that were taken by managers was to have the service providers maintain the privacy and security of the organization's sensitive data were by creating a step-by-step migrating approach to the cloud. Participant 09 (SOCT) discussed the process of moving out of on-premises

applications to cloud-based applications. The participant indicated that the best approach to cloud adoption was to take the migration plan with a step-by-step approach.

> When it came to Our organization, first, we have a small type of tool here on our premises. Those tools supported the industry. So, we have the best tools in the industry, with most of them adopted here at local premises. We know those tools in terms of how they work, how we can support the tools, how to scale the tools, and how to protect the tools. What we are doing is supporting these tools daily and maintaining the network and finding the hardware part and developing technical expertise. It takes a lot of time and financial support. We are now defining our technology on-premises based on new technologies and the best practices. Once we know this one, we are now comparing; if we are adopting the cloud services, what are the benefits and what are the challenges. What we are doing now is, as a process, we have started with a small scope at a time. For instance, we are moving Office 365, which is the outlook for email communication. Once we have started using this one, now we are moving to the application development, the application hosting services. Once we have defined this one, the ERP can be moved to the cloud. The approach and the process would be starting from the smaller part and moving to the higher part. Rather than moving all our data to the cloud, we did it step-by-step. The strategy and the best practice, most of the organizations follow this way. So, we are adopting this one and, in this process, we are now moving to the cloud.

Theme D-4: By identifying lead service providers and learn from similar organizations. Based on the participants' responses to the interview questions, one of the processes that were taken by managers was to have the service providers maintain the privacy and security of the organization's sensitive data were identifying lead service providers and similar organizations as a benchmark. Participant 12 (ICT-IDDT) discussed the process of how they identify the lead service providers as well as similar organizations that uses their services.

> What we did before we accept the service from service providers, we were trying to see who are the leaders that provide the cloud service to the world. So, we were trying to see different reports like Gartner and other third parties. We were also looking for how they perform in the global market. Are they trusted? To answer this question, we have paid a visit to Lufthansa and Emirates to understand how they are trusting their service provider's services, which services are there using in the cloud, and which company is providing them. The other requirement was requesting the service providers how their security, availability, and accessibility of their system. How are they flexible to fit with our environment or requirement? We were asking this kind of information from different companies before we made our decision. To strength our decision, we were discussing with Lufthansa on which application they are using. For instance, Lufthansa is using Microsoft services. Before we attempt using Microsoft services, we were also requesting them which companies are using their services. We were discussing with those companies and check if they are comfortable with Microsoft services. We were

also asking them, how confident are they on their security major? Do they experience any attack or vulnerability from their service provider? Once we explore all our options, we have contacted Microsoft and demand them to give us all the experience they have with their existing client. Otherwise, we were not able to trust them if they are saying in general terms such as Lufthansa is using them. We were demanding, and sometimes they are requesting us to sign NDA. So, we are doing that. We were doing this kind of assessment before our management team trust and adopt cloud services.

General Research Question

The overarching general research question that drove this study was:

RQ: How had a governmental organization in Ethiopia overcome the factors that adversely influenced managers of other organizations to the extent that they distrusted and decided against adopting cloud computing for e-government services?

The overwhelming responses to the interview questions aligned to the general research question were building trust with cloud service providers; becoming a good follower; senior management support; accessibility, availability, flexibility, and cost-effectiveness of the solution; and driven by customers' demand. The results are listed in the order of significance. The complete results are listed in Table 7.

Table 7

Breakdown of the Results Addressing Research Question

Category	Themes/Subthemes	*n*
E. Overcoming negative factors part I	E-1: Setting and sharing an organizational strategy with stakeholders	7
	E-2: Cost comparison	3
	E-3: Legal binding agreement with service providers	2
F. Overcoming negative factors part II	F-1: Building trust with cloud service providers	5
	F-2: Becoming a good follower	2
	F-3: Senior management support	1
	F-3.1: Implementing a project management methodology (Prince2)	1
	F-3.2: Bringing the stakeholders on board	1
	F-4: Accessibility, availability, flexibility, and cost-effectiveness of the solution	2
	F-5: Driven by customers demand	1
	Total	25

Thematic Category E: Overcoming negative factors part I. In response to the overarching general research question, the fifth thematic category E had six themes identified by the participants regarding how the managers overcame the negative factors to trust and adopt cloud computing for their clients. The primary themes they indicated for solutions that apply to trust and adopt cloud computing were (a) building trust with cloud service providers, (b) strong agreements with the service providers, (c) becoming a good follower, (d) senior management support, (e) implementing a project management methodology called Prince2, and (f) identifying lead services providers and learn from similar organizations.

Theme E-1: Setting and sharing an organizational strategy with stakeholders.

One of the strong responses to overcome the factors that adversely influenced managers to distrust and decide against adopting cloud computing was that of creating a strategy that includes technology as the driver in this digital world. Some participants discussed that understanding the problem first, comparing both alternatives (on-premises and cloud) with comparative analysis, and making the leadership team focus on customers' needs was the best strategy to overcome the negative factors. Some participants also added the importance of holding several briefings and discussions on the organization strategy with stakeholders was an important approach to reduce the negative factors. Participant 01 (IMCT) stated that the very first thing to overcome the negative factors is the strategy. The strategy that does not represent technology as the driver in this digital world where you have a highly demanding digital society will be a burden.

> If they start with the objectives, for example, the vision, the numbers, what is the easiest way to meet the numbers in today's world. Have we put "what is the strategy for each objective, and how are we going to do it? How are others doing it now?" The strategy has to represent well. And, next, we should have technological, techno-functional, and techno-business people, who can understand this strategy and execute in some of the places. Previously, we suffered a lot in different projects; we executed that business in different places with different strategies and objectives. Now, we have these armed IT people who know our strategy. We cannot bring software here that works somewhere else. That is the recipe for failure in different projects that I witnessed in Ethiopia. They just try to

> reply, “What is the strategy here? What is the goal, mission, or objective of the company?” So, we have armed IT people that know the company and the strategy in and out. They are the people that become our voice in terms of adopting, and also sustaining a product with us. The culture has changed at the employee level. “How do they position technology in their day to day activities?” Inhibitor or an engine for their productivity? We had successful training, motivation, consultations, to change the staff’s mindset about technology. Culture, strategy, armed technology people. Once we have that, I mean, adopting cloud or any kind of technology was easier because it ties with a strategy. Not with people’s needs. It does not go to the people in terms of what they love and what they trust. It is not personal! People make it personal because they do not have a strategy.

Participant 02 (DSADT) discussed the fact that the adoption of cloud computing is becoming mandatory in high-demanding environments. If an organization wants to be agile and respond to business changes quickly, the managers should not concern themselves with operating and maintaining an in-house data center. This kind of investment is very expensive and requires considerable knowledge and skill.

> If you want to respond to the ever-demanding business, you need to be agile and deliver products and other solutions as quickly as possible. This is where cloud computing is better than a local data center. However, this needs to be supported by strategy. Our organization has a clear IT strategy and vision guiding this transition. The other is engagement with cloud service providers, which needs to be built. There is a constant transfer of knowledge and support to understand the

> organization's working environment and constraints; our organization became reluctant due to various reasons. Those reasons were identified, and the cloud providers had helped resolve those problems. There was some reluctance regarding security, ownership, and cost, the main issues raised when addressing cloud computing. Looking back, we can see these concerns were not as significant as we initially thought. The organization strategy makes it less difficult to overcome those negative factors and made us trust and adopt cloud computing for our businesses.

Participant 04 (DPT) discussed that the best strategy to overcome the negative factors is to start from the problem that leads them to the solution by acknowledging pre-existing issues.

> If we know the problem and if we know what we want to do and what the factors are that are holding us back, the next step is knowing what to do about this. What is available to us that will help us accomplish what we want to do? Basically, when we tried to build a mobile app in-house, having all the network and other infrastructural issues with publishing it, keeping it all local was the biggest challenge we faced. We had very high application downtime, network interruptions, and inconsistencies that we needed to address. We then needed to look at other businesses and see how they are tackling similar issues. We needed to learn from them, approach bigger partners, and try to learn as we go prior to acquiring something. We reach out to the market and try to see what technologies are available. In order to assess them, we bring in the cloud providers to conduct

> research on our operating environment and have them teach us, so we learn about the solutions they offer. After that, we decide what we need to do and make available in order to present it to upper management. The other strategy we have used was, even though we do not decide whether to acquire something, we just invite cloud service providers in for a proposal and we learn more about the process. We were even sharing our challenges to them, and they were telling us how the challenges can be overcome by their services. So in the process, we not only learn from the providers, but we went for the customer of those similar solutions and try to understand how they are working using those services, what were the challenges they face, how they are they benefiting from that, we are trying to assess that and, finally, we decided to trust and adopt cloud computing for our services.

Participant 05 (EMT) explained that the best strategy they took to overcome the negative factors was to go through a thorough due diligence process of comparing both alternatives, on-premises and adopting cloud computing services.

> We have gone through a thorough due diligence process of comparing both alternatives. So, suppose we have these things running our data center, relying on a single internet service provider. The moment that link goes out, none of our customers can reach us. So that, when you multiply it by the loss of revenue and the dissatisfaction and the damage to the brand, you would say, “I am better off,” even if it is a bit expensive in terms of labor costs that may sound a bit on the high end. The availability and the reliability of running it from somewhere where at

> least, you can rely on multiple service providers is an option. So, these kinds of arguments made it easier and that it is preferred to have our customer-facing applications run in a more stable, easily accessible environment. Another is, from the trend we see, it seems as though the platform gives you the flexibility of faster execution, like, if we were to go into getting the hardware here first, the time it takes, all the processes are summed up. You can get certain things up and running quickly when you have a cloud environment. So, that made it easy or relatively to execute some of the new ideas more quickly. It has its own benefits. From that angle as well, we have seen the benefit. So, it is faster to the market. You could simply order an added server and in maybe 30 minutes or so you have it ready. So no need to plan lead times, like when do I get my server in, and when do I get that thing up and running. From that perspective, as well, it has been evaluated and found to be more advantageous. This is how we overcome the negative factors and lean towards trusting and adopting cloud computing for our services.

Participant 09 (SOCT) explained that the best strategy to overcome the negative factors was doing a comparative analysis as a benchmark. They benchmark some similar organization, so they can see how they are currently working with cloud services.

> We begin our investigation by asking the following questions. How are they dealing with the problems? how are they solving such kinds of problems? We try to make a comparative analysis with a similar organization. We must make a comparative analysis. So, based on this comparative analysis, we tried to project and pinpoint what are the problems? How can we overcome the negative factors

> and move to cloud services? So, this organization currently working in the cloud, what was the challenge for us? We think of this first until we do the technical or financial procedure. We make analysis, right? So, once we get this detailed information, we have tried to see if we can implement cloud computing for our services. Then, what is our advantage? If we are not implementing these cloud services, what is the disadvantage? This is the process we went through to overcome the negative factors before coming to a decision.

Participant 10 (ICT-SOM) explained that one of the problems of adopting the cloud was related to fears of job replacements, particularly from data center management teams. Immediately, the strategy of the management team was to focus on sharing the organization's strategy to all stakeholders to minimize the negative factors and change their mindset on cloud adoption.

> We mainly focused on organizational challenges related to fears of job replacement from the data center management teams. We held several briefings and discussions with stakeholders. The discussion focused on the adoption of cloud computing will not remove the employees from their positions. Instead, the cloud will offer us a different means of offering value to the company. This was the organizational challenge. Once they see the picture new challenges rather than replacing their position, slowly but surely, all the stakeholders start supporting the migration to the cloud.

Participant 11 (SAM) explained that the best strategy to overcome the negative factors was to turn the leadership to focus on the customers. Their customers are displaced all

over the world and they need to provide their services as close to the customers possible. The demands from the customers help them to overcome the negative factors and provide services through cloud computing.

> In our case, as I mentioned earlier, our customers are displaced all over the world. So, what do they need to access? The first one is, instead of having them come to our office or our platforms or our offices, why don't we get them to book their flights online. The first one that we made was our website. We noticed some change over there and after that, we decided to go for the mobile app to make it easier for our customers to reach us. Data mobile app. Everyone uses a mobile or a smartphone now. How can we make it easily accessible for our customers to reach us or to book a flight? To know the status of the flight. To know anything and everything about us as a company. Why don't we develop a mobile app and host it for them? So, this is a no-brainer; we cannot build and host. So, obviously, we built the mobile app. That has been accomplished in one month. Based on our customers, since they are placed all over the world, there is only one option. We must host it in the cloud.

Theme E-2: A cost comparison. The second strong response in terms of seeking to overcome the factors that adversely influenced managers to distrust and decide against adopting cloud computing was cost comparison between on-premises investment and cloud computing services. Participant 03 (ICT-ADDT) indicated that the main reason for the management team to overcome the negative factors was understanding the significant cost difference between subscribing cloud services over on-premises infrastructure cost.

> I think that the reason behind it is that there is no infrastructure cost to subscribe to cloud computing services. For instance, when we deployed an infrastructure on our own premises, there was administration cost, deployment costs, and purchasing the hardware; there are multiple costs. So, the major factor for us to migrate to the cloud is the cost; the second one is simplicity. Time to market is very important. We can deploy any application within a second source into the cloud. And then the third is availability. I think availability is the most important part. So, any time, even though it is not 100%, is it available 99.99% of the time? As I told you, we are hosting a mission-critical application into the cloud. Since we subscribe to a service from the cloud, we do not have any of the downtimes. These are the major factors to move to the cloud.

Participant 07 (ICT-SOM) explained that the best way to overcome the negative factors was to research the cost-benefit analysis on both alternatives. The result of the research was that cloud computing is a lot more cost-effective than building a data center.

> We researched. Our homework is to research the pros and cons of the Internet. We research what benefits we get when we go to the cloud. How can we achieve our goals? For instance, for customer services, we want to reach our customers with all channels available. How can we get that? Can we get the services with on-premises products? We can never get that with this very fast-growing industry (the IT industry) and very challenging industry. The industry is very challenging because of the bill of cost. The bill of cost is always right, and also competition is getting very fierce. The only way we can avoid this is if we work on the cost

> development at least and reduce the cost. How do we reduce the cost and improve our customer services? We would need to shift the sales channel from traditional ones into modern ones, which is online sales. Instead of ticket offices, why don't we use mobiles? Why don't we use websites? Why don't we use the call centers? We monitor our customers. How do we get connected to them? The only solution we get… it is very difficult to find an on-premises solution which can reach our needs and expectations when you become a hundred million, maybe in five or ten years. You have to think of that, we are twenty million, but we need to grow faster than we are growing. That is my belief. We are growing up, not traditionally. When you go digital, it will be exponential growth, right? It is every two years, or maybe one year now, everything is doubling, right? That is how we overcome the negative factors and adopt cloud computing as our prime service channel for our clients.

Participant 12 (ICT-IDDT) explained that different companies are coming here to discuss with them how they should adopt the cloud. However, we have to go through several checking procedures to overcome the negative factors before we attempt to consider them as an option to their on-premises infrastructure.

> First, I am asking how their infrastructure looks like today. Are they using onsite solutions? If they are not using onsite solutions, then the requirement is to get some specific application or domain of infrastructure. We prefer them to move to the cloud because that is a cost-effective solution. The other one is the availability because, to build an infrastructure, you need to have all the facilities, like UPS

> power, generator, air conditioner, like this. So instead of investing in these kinds of investments into smaller requirements and smaller applications, we prefer them to go to the cloud. The first thing they are requesting in this recommendation is how our data is secured. As I said, we told them whether you are putting it in your data center or in the cloud, the security concern is always there. To address this security, we need to implement different layers of security mechanisms instead of resisting the adoption of the cloud.

Theme E-3: Strong legal binding with service providers. The second strong response to the matter of overcoming the factors that adversely influenced managers to distrust and decide against adopting cloud computing was having a strong legal binding contract with service providers. Participant 06 (BADT) indicated that having a strong legal agreement between their organization and the cloud service providers helped the organization to overcome several factors that adversely influenced managers to distrust and decide against adopting cloud computing for their services. Participant 08 (TDCT) also indicated that the service-level agreements they had with the cloud service providers helped to provide more confidence regarding the security and privacy of their data and to overcome the negative factors to trust the cloud service providers to host their data.

> The years of doing business with almost no data breach happening made the management very confident in the migration to the cloud. This builds confidence: no breaches, and no issues. That communicates that Azure is secure. To add to this, Microsoft Azure provides different services, which guarantee the security of the data in the first place outside than the agreements. The agreements are for

> extenuating circumstances. By default, the service that they provide handles privacy and security issues. For instance, they give you service for the key vault, where you can store encrypted data so that any eavesdropper could not interpret sensitive data. There are different encryption options that they provide so that the data being stored in the cloud can be encrypted and be decrypted when needed by the customer or the user. There are all these mechanisms they are providing us. The security features are not priced separately; they just come as a bundle. They are packaged into any service they provide to ensure privacy and security are implemented. This process is helping us to overcome the negative factors that affect the managers not to trust and adopt cloud computing.

Thematic Category F: Manager overcoming negative factors part II. In response to the overarching general research question, the sixth thematic category F had five themes identified by the participants regarding how the managers overcame the negative factors to trust and adopt cloud computing for their clients. The primary themes they indicated for solutions that apply to trust and adopt cloud computing were (a) building trust with cloud service providers, (b) strong agreements with the service providers, (c) becoming a good follower, (d) senior management support, (e) implementing a project management methodology called Prince2, and (f) identifying lead services providers and learn from similar organization.

Theme F-1: Building trust with cloud service providers. The next common response to overcome negative factors was to build trust in adopting cloud computing.

Participant 01 (IMCT) explained that a trusting cloud is not an option anymore if we want to stay competitive in the market.

> Trust, for me, I could see it from a very different perspective. Technology has those risks that make you reluctant to trust others. But how do I survive in this digital world? And, how should I overcome the issue of trust? Either a methodology, a technology, or a process that is already built that will help me to overcome the challenge of this trust. If you put survival first, which is an issue of surviving in the market because the millennial generation demands contactless experience, we need to deliver a service at the client's fingertips. That is the most driver in the competitive world. If we live in a monopoly world, we may stay for some time. However, the consumer that we are having is highly digital, and they need everything at their fingertips. So, for us, it is a survival tactic. To provide this experience, I need to be agile; I need to understand how to scan the environment and the competition. "How can I stand out from the competition?" I need to be agile in providing those experiences to the customers. If I to be agile, I need cloud computing services. That is the survival issue. During our assessment, the risk of not trusting cloud computing was higher than the alternatives. Therefore, the risk of not trusting cloud computing will result in being left behind in the market. Besides, in this competitive world, we have to be digitized. That is the competition first.

Participant 02 (IT Manager) explained that building trust initially starts internally within the organization itself. To develop trust towards these opportunities and realize their

business objectives, organizations need to see or study opportunities, whether its cloud or any other trending technology.

> We need to study its potential first. Then, in the process, they can also benchmark or seek out testimonies from companies who have successfully embraced the cloud. That will also help to build confidence. They can then engage these providers to learn the solutions that potentially help realize their business objectives and clarify any confusion. However, cloud service providers also need to understand the context of the organization's operating environment and provide a solution tailored to their environment. For example, there could be some data protection privacy legislation in any working environment, so the providers need to understand and help them comply with regulations that might cause problems. Also, the organization might not know these technologies, so the providers need to offer guidance and support. These are the ingredients for success; this will require a level of understanding from both the organization and the cloud service provider.

Participant 03 (ICT-ADDT) stated that most of the people who do not already trust the cloud, in his opinion, are those who do not have much knowledge about technology.

> They do not have much knowledge about the benefits of cloud infrastructure. If they dig in and research the cloud infrastructure and compare it with the privacy information and like that, so they will understand the benefits of the cloud. So, they should, first, understand what cloud is, and then what kind of benefits they will get from the cloud infrastructure, and then compare it with the negative

> factors, and then it is up to them to decide whether or not to move to the cloud. And, also, the other benefit is that we are getting an update, automatically, into the cloud. For example, if you deploy a screen saver, if your renewal is updated, Microsoft automatically updates that server by themselves. So, we are getting up to date on the infrastructure in the cloud. With on-premises, we have to deploy and turn off the database for an upgrade.

Participant 05 (EMT) defined trust as building a relationship between the service provider and the taker. The participant indicated that the relationship should be more transparent visits on how that data center is running, what the provider follows internal processes will help in building trust.

> And of course, constant engagement with these regularized part of the meetings. Making the customer feel as though he is a part of, or that he owns specific processes of the service provider. You making them a part of that process helps because we get consulted on what they plan to do and how it will help. So, in whatever decision they take, when they involve their customers, we feel that they are moving in the direction that we give them. And so, we do not feel like they will do something that the majority of the customers are not in favor. So, we know what is coming; the concern, we raise it, we could extend the planned activities until we create that comfort level and so on. These sorts of things help a lot to build trust.

Participant 10 (ICT-SOM) discussed trust could be built from people's openness to accept new technologies rather than focusing on day-to-day activities.

> The first thing is personality. I choose to focus on the organization strategies, which is to ensure the systems' availability in the cloud, rather than fear of job loss at the presence of newer technology. We need to make sure our company is focused on the core business, not on the day-to-day activities. Take a furniture company, for example. They have different sales websites, and if they have dedicated IT people to focus on IT rather than furniture, then it is going to be difficult. We need to think outside the box. That comes with the personality. The other thing is to evaluate the leading companies and emulate their best practices. Currently, we are not inventing, but it is fortunate for us to adopt best practices because others have already implemented such technologies. There are successful, which makes the adoption of the cloud easier.

Theme F-2: Becoming a good follower. The next typical response to overcome negative factors was to be the best follower of similar organizations. Participant 01 (IMCT) strongly indicated that to become a substantial follower until we built in-house capability and then to move to a leadership role when it comes to trusting and adopting cloud computing.

> There are two strategies. We have been saying that we have to be the best followers. We are not taking risks to begin to experiment, but, in our next vision, we are already meeting this vision 2025, so we are having a new vision called 2035. In that, we are just doing the brainstorming and also environmental scanning even to be the first in some of the streams; in some of the areas. In that case, that experiment area will be there. We will have a lab where we can call a

> university or start-ups to experiment on new ideas and new technologies like IoT, virtual reality, AI, into our business process. That is already there, but for now, to vision 2025, follow other similar organizations to; bring the best products used by the best companies and then minimize the risk to overcome the negative factors.

Participant 09 (SOCT) indicated that being a good follower saved the organization from making significant mistakes. At first, all the management team wants to know who is using what kind of services from which service provider. After paying a visit to a similar organization, the management team gained momentum and confidence to trust and adopt cloud computing for the e-government system.

> We will have to look and benchmark how other companies are working with cloud computing services. Such kinds of things helped our management team to build confidence and trust with cloud services. It is a new thing; it is a new technology. Our top leaders want to see the front liners. For instance, the Fortune 500 companies are now moving to the cloud. If you want to be competitive with the market, you should have to follow this organization. What are the steps and the techniques that they are currently using? It will be an input for our leaders to trust and adopt cloud services.

Theme F-3: Senior management support. The most common response to overcome negative factors was their strong leadership support. One of the TOE framework organizational elements was senior management support. Researchers agreed that senior management support, including managers and executives, influences the adoption of new technologies and directly affects the adoption of cloud computing for e-

government services (Schniederjans & Yadav, 2013). The top leadership team of the selected organization was convinced with the multiple advantages of cloud computing for e-government services overusing on-premises resources. The participants indicated that the openness and exposure to foreign countries of their CEO helped to speed up the adoption process of new technologies. Based on their supportive executive management team, they can see the cost of running the infrastructure on-premises such as data center, redundancy, data recovery, electromechanical, local expertise, and talents that manage the infrastructure as well as the initial capital cost. Because of it, participant 01 (IMCT) explained that the top leaders are pushing us to move to the cloud than we push them for their approval.

> The point here is maybe we are lucky enough to have high-level management, a group CEO who was working for a couple of years abroad such as New York and different places. So, for us, they're just pushing the technology to go to the cloud. Done! Yeah, initially, there were some discussions on privacy, security, and all other stuff as major challenging issues or negative factors. However, after we have this new CEO, eight years back, he has been just pushy to make it because the driver from the management was agility. Agility means I want things today, and it becomes the culture of our organization. So, if you want to be ahead of the competition today and tomorrow, we need agility, flexibility, and scalability. The management has decided to invest in technology to address the need for agility. So, leadership supportiveness and positiveness helped us to overcome most of the negative factors. As an organization strategy, we have a 15-year vision based on

> four pillars, such as human resources, fleet, network, and the fourth one is technology. To achieve a 15-year vision, the organization leaders said boldly that we would invest millions of dollars in technology.

Sub-theme F-3.1: Implementing a project management methodology (Prince2). The third theme indicated that implementing a project management methodology helped to overcome the factors that adversely influenced managers to distrust and decide against adopting cloud computing for e-government services. Participant 01 (IMCT) explained the situation by referring to a project that was failed due to a lack of senior management team involved in a decision-making process.

> We had projects that failed. It failed; it is not because they are not meeting the schedule or the budget. Rather, the typical challenge was that we were not making the senior managers as a part of the decision-making process from the very beginning. So, involving the stakeholders; even, the employees, from the very beginning was an issue in most of the projects. However, after we introduced a project management methodology, called, Prince2, the senior user has to be involved from the very beginning. They have to identify the problems that they were facing during their work life. They know the pain, and what kinds of potential problems that the new products or solutions could address from the very beginning. So, lack of engagement of stakeholders has been hindering the adoption process, but now, that is not the case. Right after we implemented this project management methodology (Prince2), we never had the problem of adopting new technologies such as cloud computing.

Sub-theme E-3.2: Bringing the stakeholders on board. One of the strong responses to overcome the negative factors that affected managers not to trust and adopt cloud computing was the inclusivity of the required stakeholders into the decision-making process. Participant 10 (ICT-SOM) explained that to overcome the challenges related to fears of losing a job, the organization deployed a project management methodology to prepare the stakeholders for the cloud adoption process.

> We mainly focused on organizational challenges related to fears of job replacement from the data center management teams. We held some briefings and discussions together. Instead, the cloud will offer us a different means of offering value to the company. This was the organizational challenge. The other major thing is to have many of our systems move over to the cloud. We decided to go for business-to-customer solutions in the cloud because many of our customers are outside Ethiopia. Most of our passengers are transit passengers, so they need to have the availability, accessibility, and performance of the systems that the cloud provides.

Theme E-4: Accessibility, availability, flexibility, and cost-effectiveness of the solution. One of the reasons the managers and decision-makers of the organization overcame the negative factors that affect them not to trust and adopt cloud computing was the understanding of the cloud computing accessibility, availability, flexibility, and cost-effectiveness of the solution over on-premises solutions. Participant 03 (ICT-ADDT) explained that a trusting cloud brings multiple advantages (a) accessibility, (b) availability, (c) flexibility, and (d) cost-effectiveness of the solution.

> I think one of the reasons behind cloud computing adoption was that there is no infrastructure cost. For example, if you deploy infrastructure on-premises, there is administration cost, deployment costs, and hardware costs, there are multiple costs. So, the major factor overcoming the negative factors, and adopting cloud computing was the cost-effectiveness. The second one was the simplicity of the system at any time. Time to market is very important. Also, it is agile. You can deploy any application within a second source into the cloud. And then the third is availability. I think availability is the most important part. As I told you, we are hosting mission-critical applications into the cloud. As of now, we do not have any downtime. These were the major factors for us to trust and adopt cloud computing for e-government services.

Participant 12 (ICT-IDDT) indicated that once we understand the accessibility, availability, flexibility, and cost-effectiveness of the solution, we have built confidence in cloud computing.

> Once we understand and convinced the accessibility, availability, flexibility, and cost-effectiveness of the solution, we moved all our development and quality process, especially with customer-facing applications to the cloud (Microsoft Azure). The service providers helped us sampling our products in the cloud with a select number of customers to test their environment on behalf of us. Fortunately, our business environment helped us a lot because we have different offices in different regions. So, we were using those offices to access the cloud environment. Almost all the cloud services are pay as you go. We were

considering all these things. We were trying to see how we were saving costs versus maintaining an in-house infrastructure. By doing that, the result of the study provides confidence to upper management team like application samples to different teams to see how the availability and the flexibility of the environment, the cost-effectiveness, and the manageability as well. We even looked at the security. Some organizations are also embedded in the quality environment, security alert technologies. So, whenever they see unauthorized access, they receive a notification. We are trying to build this confidence. So, we recommend for such kind of management to try and put some application which is not critical for the customer to the cloud and see the results regarding security, accessibility, manageability, and the cost-effectiveness. We prefer to see the benefit of the cloud in this manner, and it works.

Theme E-5: Driven by customer's demand. One of the strong responses to overcome the negative factors that affected managers not to trust and adopt cloud computing was listening to demanding clients. Participant 11 (SAM) explained that to overcome the challenges related to reaching the clients and providing the clients with the best services possible, we need to deliver products that can be accessed from anywhere and at any time.

In our case, as I mentioned earlier, our customers are displaced all over the world. So, what do they need to access? The first one was, instead of having them come to our office or our platforms or our branch offices, why don't we get them to book their flights online. The first one that we made was our website. We noticed

> some change over there, and after that, we decided to go for the mobile app to make it easier for our customers to reach us. Everyone uses a mobile or a smartphone now. How can we make it easily accessible for our customers to reach us or to book a flight? To know the status of the flight. To know anything and everything about us as a company. Why don't we develop a mobile app and host it for them? So, this is a no-brainer; we cannot build and host. So, we build a mobile app. That has been accomplished in one month, I believe. Based on our customers, since they are placed all over the world, there is only one option. We must host it in the cloud.

Summary

In Chapter 4, I included the details of the data collection, data analysis, and results obtained from multiple data points. The chapter contained a discussion of the findings generated by using thematic analysis of the interviews with the 12 participants pertaining to three major projects. In this study, I included appropriate steps to adhere to the ethical bounds set forth by the IRB and incorporating an informed consent approach served to protect the rights of the participants. The specific problem that I sought to address in this study was to try to ascertain why managers of a governmental organization in Ethiopia ultimately chose to trust and adopt cloud computing for e-government services, despite their initial uncertainty or misgivings regarding security and privacy. The purpose of this single case study was to provide a deeper understanding of how a governmental organization in Ethiopia overcame those factors that adversely influenced managers of

other organizations to the extent that they distrusted and decided against adopting cloud computing for e-government services.

The qualitative thematic analysis led to 21 themes and four subthemes. The analysis of results revealed various technological, organizational, and environmental negative factors that affect the managers not to trust and adopt cloud computing. The participants validated the findings of the study and reinforced the negative factors that influenced the managers and how they overcame those negative factors. I identified through the responses that this organization was one of the first governmental organizations in Ethiopia that overcame the negative factors by (a) building trust and signing strong agreements with cloud service providers; (b) becoming the best followers; (c) getting strong support from top executives; (d) understanding of accessibility, availability, flexibility, and cost-effectiveness of the cloud solution; and (e) an understanding of customers' demands to trust and adopt cloud computing. In Chapter 5, I include the interpretation of findings, limitations, recommendations, and opportunities for future research, and the contribution of this study to social change.

Chapter 5: Discussion, Recommendations, and Conclusions

This chapter contains the discussion of the findings in relation to the existing literature about trust and the adoption of cloud computing for e-government services. The general research problem was how to overcome factors that cause most of managers at governmental organizations in developing countries such as Ethiopia to be reluctant to trust and adopt cloud computing for e-government services, especially while some managers of a governmental organization overcame this lack of trust. The specific research problem that I sought to address in this study was why managers of a governmental organization in Ethiopia ultimately chose to trust and adopt cloud computing for e-government services, despite their initial uncertainty or misgivings regarding security and privacy. The purpose of this qualitative, single case study was to provide a deeper understanding of how a governmental organization in Ethiopia overcame the factors that adversely influenced managers of other organizations to the extent that they distrusted and decided against adopting cloud computing for e-government services. This single case study approach involved the exploration of three major projects (Microsoft Azure, AWS, and Sabre) in which cloud computing was being adopted for e-government services. This qualitative thematic analysis of the interview responses led to twenty themes as well as four subthemes, all of which related closely to the research questions.

The overarching general research question that drove this study was:

RQ: How had a governmental organization in Ethiopia overcome the factors that adversely influenced managers of other organizations to the extent that they

distrusted and decided against adopting cloud computing for e-government services?

I devised the following research subquestions to assist in answering the overarching general research question, aimed at managers who decided to trust cloud computing for the implementation of e-government services in Ethiopia. The research subquestions were:

RSQ1: What negative factors influenced the managers of a governmental organization in Ethiopia to the extent that they came to distrust cloud computing for e-government services?

RSQ2: How have the managers of governmental organizations in Ethiopia dealt with both positive and negative key factors in terms of keeping the organization's information safe, especially their critical information?

In this chapter, I include the interpretation of the findings reported in the existing literature. The literature that was grounded in the TOE framework and the DOI theory was suitable for conceptualizing the influence of technological, organizational, and environmental factors that adversely influenced managers of other organizations to the extent that they distrusted and decided against adopting cloud computing for e-government services. Key negative factors highlighted various technological, organizational, and environmental factors such as (a) protecting the privacy and security of clients' data, (b) taking risks, (c) perceiving the process as exporting jobs resulting in the loss of their jobs, (d) facing a learning curve and (e) lacking understanding and resistance to change.

I decided that using a single case study approach was suitable for providing a deeper understanding of how a governmental organization in Ethiopia overcame the factors that adversely influenced managers of other organization to the extent that they distrusted and decided against adopting cloud computing for e-government services. In the following sections, I present a discussion on the interpretation of the findings and the limitations of the study. I also provide recommendations for ways in which the cloud computing adoption process might be improved as well as identifying opportunities for future research. I conclude the chapter by offering a brief discussion of the insights and realizations that I gleaned from the results of the study.

Interpretation of Findings

The purpose of this study was to provide a deeper understanding of how a governmental organization in Ethiopia overcame the factors that adversely influenced managers of other organizations to the extent that they distrusted and decided against adopting cloud computing for e-government services. The analysis of individuals' lived experiences provided a rich set of findings that managers might use to trust and adopt cloud computing for e-government services in the future. This section includes the discussion of the findings in relation to the existing literature on the subject. I drew the focus of the discussion from the overarching general research questions that I devised for this study. I addressed the overarching general research question by using RSQs 1 and 2.

Overarching General Research Question

The overarching general research question that drove this study was:

RQ: How had a governmental organization in Ethiopia overcome the factors that adversely influenced managers of other organizations to the extent that they distrusted and decided against adopting cloud computing for e-government services?

I addressed the overarching general research question upon completion of the analyses of the first and second research subquestions by establishing the negative factors. I also addressed the overarching general research question by identifying possible solutions with which such organizations may overcome the negative factors.

Three main resolutions emerged from the analysis of how managers might seek to overcome the negative factors that prevent them from trusting and adopting cloud services. The first resolution to overcome negative factors was to build trust with cloud service providers by studying the service providers' potential, understanding the features and benefits of cloud services, and eventually signing strong agreements with service providers. The second resolution to minimize risk was to follow other similar organizations in the industry that highlight the best products that were being used. The third resolution to ensure success was to secure strong support from the senior management team. Researchers agreed that the support of senior management, including managers and executives, influences organizations' decisions as to whether or not to adopt new technologies and, thus, directly affects the adoption of cloud computing for e-government services (Schniederjans & Yadav, 2013). The participants indicated that their CEO's openness and exposure to foreign countries helped to speed up the process of adopting new technologies.

The idea of computing in a cloud environment started back in the 1960s, when John McCarthy predicted that: “one day, the computer I am using might someday become a utility computer like other utilities, such as the telephone system for governmental service” (Simamora & Sarmedy, 2015, p. 2). Three years ago, one of the organizations became one of the first governmental organizations in Ethiopia to subscribe to cloud computing as a utility for front end applications. The system was designed so that customers simply pay for what they used, like utility bills such as electricity, water, and gas (Durao et al., 2014). At present, governmental organizations like the one that I selected to participate in this study are facing a rapidly changing environment that forces them to seek high-performance computing power that allows them to build, integrate, and reconfigure competencies. The findings of this study confirmed what has been found in the peer-reviewed literature that I described in Chapter 2.

Most of the participants indicated that not building trust with cloud service providers was not an option anymore if organizations want to remain competitive in the market. According to the participants, technology had its risks that made the managers reluctant to trust and adopt cloud computing. However, they asked themselves, “How do we survive in this digital world?” and “How should we overcome the issue of trust?” Either a methodology, a technology, or a system that has already been built helped the managers to overcome the challenges of allowing themselves to trust in cloud computing., Trust was a crucial element for organizations to obtain a competitive advantage. Previous researchers failed to address the issue of trust in the context of research into cloud adoption for e-government services (Schniederjans & Yadav, 2013).

For instance, in order for governmental organizations to adopt new technology, they need system security, a TOE framework technology element, and trust among users, service providers, and consultants based on goodwill, contractual agreements, and competency (Schniederjans & Yadav, 2013).

Contractually, service providers were required to provide organizations with all the necessary information, including a system's capabilities and limitations. For managers to be able to make an informed decision as to whether or not to adopt cloud computing, the relationship between the organizations and service providers must be built on trust. Managers required consultants to undertake duties on the basis of contracts. As a result of face-to-face interviews, semistructured observation, and organizational documents, I discovered that the selected organization's managers had created a process that showed them how to identify the best service providers and how to build trust with them. The findings of this study introduce additional knowledge in the discipline, such as describing a process by which a manager may cultivate trust with service providers compared to what has been found in the peer-reviewed literature under the TOE framework environmental element of trust. For instance, for governmental organizations to adopt new technology requires system security, a TOE framework technology element, and trust that must exist among users, service providers, and consultants based on goodwill, contractual agreements, and competency (Schniederjans & Yadav, 2013). The findings of this study could also contribute to existing knowledge by starting a scholarly discussion regarding explanations as to how to overcome the reluctance of managers at governmental organizations to trust and adopt cloud computing for e-government

services, as well as how at least one governmental organization in a developing country such as Ethiopia overcame this lack of trust.

One of the reasons as to why the managers and decision-makers of the organization were able to overcome the negative factors that had contributed to their initial feelings of distrust and reluctance about the prospect of adopting cloud computing was the understanding of the accessibility, availability, flexibility, and the cost-effectiveness of cloud computing as a solution, in comparison to on-premises solutions. Most of the participants clearly stated that a lack of understanding about cloud computing had created fear, and fear created resistance to change and to understanding change with an open mind. Before the adoption of cloud computing, most of the participants did not know that the costs of deploying infrastructure, administration costs, deployment costs, and hardware costs for on-premises were higher than those for subscribing to cloud computing. For instance, the cloud-based application helps the organization to reduce facility management and energy costs by using cloud servers as opposed to local servers (Cheng et al., 2015).

After several debates and heated discussions, the managers of the organization realized that cost-effectiveness, simplicity, time to market, moving to agility, and availability of cloud computing was pushing them to overcome the negative factors and they decided to adopt cloud services for front-end services. As discussed in Chapter 2, the researchers indicated that one way in which cloud users were reducing their ICT costs was by using their cloud service provider's infrastructure, such as computing processors, storage space, application software, hardware, network bandwidth, and paying for these

services as they would for utilities (Wang et al., 2014). The findings of this study confirm what was found in the peer-reviewed literature under RSQ1's three categories: technological, organizational, and environmental negative factors.

Research Subquestion 1

RSQ1 is as follows: what negative factors had influenced the managers of a governmental organization in Ethiopia to distrust the use of cloud computing for e-government services initially? The focus of the first research subquestion was on the negative factors that affected the managers of a governmental organization in Ethiopia to the extent that they distrusted and decided against adopting cloud computing for e-government services. The thematic analysis of the study indicated that negative factors play a significant role in the process of trusting and adopting cloud computing by the organization. Based on the TOE framework, I used (a) technological, (b) organizational, and (c) environmental categories to address RSQ1, which assisted in exploring the influence of various negative factors in technology-enabled organizations. Each category had at least one theme and sub-theme, which indicated the association of each negative factor with the adoption of cloud computing.

Technological negative factors. The technological context included both the technologies that were already in place in the organizations; and the technologies that were created, developed, and marketed but not yet deployed in the organization. The TOE conceptual framework, from the context of the negative technological factors, included elements such as (a) ICT infrastructure, (b) relative advantage, (c) compatibility, (d) security concerns, (e) complexity, (f) efficiency, (g) competencies, and (h) cost

savings (Ismaili, 2016; Kinuthia, 2015). Based on the participants' responses to the interview questions, almost all the participants stated that they were using Microsoft Azure, Amazon web services (AWS), and Sabre technology solutions as their primary cloud technology providers for the products such as mobile app and web-based application in the cloud. In the technological negative factor category, most of the participants reported the following: protecting the privacy and security of the data, lack of accessibility to data and confidentiality, taking a risk, and the cost of ownership were all at the top of their lists of negative factors. The participants clearly stated that the organizational strategy to move the business globally and establish branch offices globally, the lack of quick response time and availability of the infrastructure from the only service provider in Ethiopia (Ethio Telecom), despite the concern on the privacy of the customers, and the significant increase in the cost of managing the on-premises data center, the managers have no choice but to balance between the existence of the organization in the market and privacy and security of the data. As a result, the organization decided to trust and adopt cloud computing to its clients.

Organizational negative factors. The organizational context associated with the resources and characteristics of the organizations included structural links among employees, intra-organization communication systems or processes, the size of the organizations, and the capacity of slack resources. In this study, I found that there were different ways in which the organizational context impacts the new technology adoption and implementation process. As discussed in the literature review, the organizational TOE framework elements were organizational size, organizational scope, centralization,

formalization, organizational readiness, top management support, project management, and best practice (Jia et al., 2017, Kinuthia, 2015). After conducting the research, I was able to identify the negative organizational factors as being that cloud computing was perceived as exporting jobs and, thus, causing a loss of individuals' current jobs, not engaging the stakeholders at the beginning of the decision-making process, the culture of leadership in setting the tone, poor cooperation and resistance from other organizations, and learning curve and open mindset. Initially, until the pros and cons were fully understood, the managers had debates and heated discussions. But, over the years, after the managers got over those issues and people saw the stability and other added benefits of cloud computing, the perceived negative factors started to decrease in number. The managers now have no significant differences of opinion in their strategies concerning adopting the cloud. As discussed in the literature review, several researchers agreed that senior management support, including managers and executives, influences the adoption of new technologies and directly affects the adoption of cloud computing for e-government services (Schniederjans & Yadav, 2013). The findings of this study demonstrated that the senior management strong support due to the exposure of working abroad and believed in agility helped to overcome the negative factors such as security and privacy issues to trust and adopt cloud computing for their e-government services. Based on the participants' responses, the drive for agility, flexibility, scalability, and pay-as-you-go services through cloud computing for their e-government services comes from the senior management, which contributes significantly to the cloud adoption process. The participants also described their senior management as proactive leaders who make

them unique, compared to other partners and organizations, not just the organization here in Ethiopia but also globally.

Environmental negative factors. Regarding the environmental negative factor context, governmental organizations need to analyze their ability to adopt new technologies using SWOT (strength, weakness, opportunities, and threats) analysis tools (Bull et al., 2016). The third component of the TOE conceptual framework was the environmental factor. Due to the external factor that affects the organization in ways that were beyond their control, the factor of the environment influences the adoption of new technologies. As discussed in the literature review, the TOE framework's environmental elements include competitive pressure, trust, and external pressure (Awa & Ojiabo, 2016; Jia et al., 2017). Having conducted this research, I was able to identify the negative environmental factors as being a lack of understanding with the learning curve, resistance to change, and external pressure due to a lack of local infrastructure. The participants reported that the lack of knowledge of the methods of using cloud services created a significant learning curve on all the new technologies for decision-maker managers.

In addition to the learning curve, the managers struggled to get all the team members to accept new things due to either their cultural beliefs or their upbringings. This situation created unexpected resistance to change. A part of this resistance to change was participants feel that moving to the cloud was redundant as they invested heavily in an onsite data center such as Vblock. This study found another negative environmental factor, which was an external factor that affected the organization from getting the required internet connectivity from the only service provider in Ethiopia. To access cloud

services, they needed connectivity and were entirely dependent on the external organization. The managers overcame the challenge of internet connectivity by adopting cloud computing to reach global clients while working with the local service provider.

Research Subquestion 2

RSQ2 was as follows: how had the managers of a governmental organization in Ethiopia dealt with both positive and negative key factors of keeping the organization's information safe, especially their critical information? The focus of the second research subquestion was on how the managers dealt with the service providers to keep the organization's information safe. As discussed in the literature review, Ruivo et al. (2014) defined the best practice as taking the form of the process of migrating, configuring, and customizing applications delivered by cloud service providers to meet the organizational requirements. To measure the level of configuration, customization, and level of ease of use, managers of this organization used their best practice experiences to meet the organizational requirements. In this study, I identified four themes within one thematic category, which was the process of keeping the information of the organization safe.

The managers were able to keep their critical information safe by (a) creating a process from selection to hiring service providers, (b) signing a legal binding agreement with service providers, (c) creating a step-by-step approach to the cloud, and (d) identifying lead services providers and learn from a similar organization. The participants reported that the organization had projects that failed. It was not because they were not meeting the schedule or the budget. Instead, the top leaders did not involve the senior managers as a part of the decision-making process from the very beginning. After they

introduced a project management methodology called Prince2, the senior managers took the lead in creating a process of keeping the information of the organization safe. Project managers help organizations to plan, communicate, and efficiently integrate with their service providers and supply chains, as well as disseminating skills and knowledge across the organizations. As discussed in the literature review, Starinsky (2016) noted that to maximize organizational performance, project managers use best practices, such as running a lean operation, collaborating, and improving time-to-market.

The results of this study is could contribute to the extension and acquisition of knowledge in the discipline. In this study, I demonstrated how a governmental organization in Ethiopia internally disseminated the skills and knowledge of its staff by engaging people in training. As a result of this process and securing the sponsorship from the top management, the use of digital became the culture and norm of everyone within the organization. The culture of the organization has changed. Because upper management set the tone that every project or initiative must run digitally, employees felt good that they were not adding to the waste stream by no longer working with paper products. In the end, the way of the organization's life became digital and paperless through the use of cloud computing from their service providers. It is useful to compare these study findings to what has already been found in peer-reviewed literature under the organizational TOE framework regarding the importance of top management support, project management, and best practice (Jia et al., 2017, Kinuthia, 2015; Ruivo et al., 2014; Schniederjans & Yadav, 2013; Yoon & George, 2013), as I discussed in some detail in Chapter 2.

Limitations of the Study

This study consisted of various forms of data collection that included face-to-face interviews, semistructured observation, and organizational documents. Yin (2014) defined limitation as being the aspects of a study that the researcher cannot control. Through understanding the limitations of this study, I was able to factor any potential design and methodological weaknesses into the approach, including the limitations of dependability and transferability. The primary limitation of the study was that it included only one organization in Ethiopia. Although analyzing the responses of all study participants across three major projects and validating the data against semistructured observation and organizational documents addressed the matter of negative factors and how the managers overcame them, no notable factor seems to hinder the transferability of the study. In any qualitative research design, transferability is not assured (Merriam & Tisdell, 2016). Due to the limitations of resources and funding, it was not possible to perform the study on multiple organizations in Africa. By taking a theoretical stance and understanding that African countries have similar infrastructures and governing policies, the results might be transferable; however, further research is necessary to confirm the transferability of results.

Recommendations

The purpose of this study was to provide a deeper understanding of how a governmental organization in Ethiopia overcame factors that adversely influenced managers of other organizations to the extent that they distrusted and decided against adopting cloud computing for e-government services. In presenting the results aggregated

from this study, I revealed the influence of technological, organizational, and environmental negative factors that were typically associated with the adoption of cloud computing, which can help decision-makers in organizations to improve their cloud adoption processes. I have, accordingly, developed several recommendations for future research and practice.

Recommendations for Practice

During the study, the participants highlighted the importance of being a *good follower*. Understandably, the organization chose to be a good follower when it came to the question of trusting and adopting cloud computing for e-government services. One of the participants clearly stated that, with their vision year 2025, they were saying that they have to be the best followers. With the vision year 2035, they were brainstorming and scanning the environment on how to be the first to adopt cloud computing for some of the cloud streams. When it comes to trusting and adopting cloud computing resources, organizations must improve the skillsets of their personnel and increase their exposure to cloud technologies so that they can be leaders rather than followers. It is also essential that staff comprehend the importance of representing the company effectively. The organization is customer-oriented, and management must implement a strategy to ensure that staff receive training and can handle cloud-based customer queries from inception to the close of the service implementation.

Organizational leaders should incorporate a risk management approach into the cloud adoption process to mitigate various known and unknown risks and to increase the success of the cloud-based service implementation. Having a stricter educational and skill

requirement when screening staff members helped to ensure all members were capable of performing their roles within the cloud-based organization. It is equally important to have an environment of continuous improvement to evaluate the strengths and weaknesses of employees and provide them with regular cloud-based training to remain competitive and productive.

Telecom infrastructure plays a significant role in the economic growth of the country. Another recommendation is to obtain optical wavelength connectivity that allows the organization to have access anywhere in Ethiopia without a constraint of bandwidth. The Optical Wavelength Service (OWS) is a fiber optic-based service that provides dedicated, point-to-point, single-fiber data transport at speeds ranging from 1 to 100 Gbps. Almost all the participants raised significant concerns about the current connectivity that they have from the only service provider in the country. The lack of such infrastructure contributed to prohibiting the organization from having more cloud services or sharing and circulating their data, by using on-premises infrastructure, throughout the country. After the analysis that I conducted for this study, the recommendation is to establish a telecom regulatory authority that would take the necessary steps to improve the infrastructure of the country. It is also important to establish stricter processes and policies within government sectors to improve the level of process orientation and punctuality. Delays in processing within governmental organizations affect the organization and consumers and hinder the economic growth of the country.

Most participants indicated that, once they understood the accessibility, availability, flexibility, and cost-effectiveness of the solution, they fostered confidence in cloud computing. I recommend that organizations train all the stakeholders who will be involved with assessing the benefits of cloud computing, (a) flexibility, (b) efficiency, and (c) strategic value, to compare these with the advantages of on-premises investment. Flexibility provides scalability, storage options, control choices, tools selection, and security features. Efficiency provides accessibility from virtually any internet-connected device, speed to market, data security, saving on equipment, and pay structure. Strategic value ensures streamlined work, regular updates, collaborations between individuals in widespread locations, and a competitive edge.

The other recommendation is that organizations should continue to listen to their clients. The clients still go to the organization's sales office across the cities and their agents to obtain their services. The participants indicated that they still need to undertake more work in the cloud so that their clients do not have to go to their offices or their platform or their branch offices. The first solution that they attempted took the form of a web-based application that encounters significant problems in connecting to their hosting servers. The second application that they built was a web app that is better than a web-based application; there are still significant problems with accessing it, especially within the countryside. At this point, all the applications have been developed by the organization but are not hosted by their organization. The recommendation for the future is the organization to be able to execute both, building the applications and hosting their applications on their dedicated servers.

Recommendations for Future Research

In presenting the findings of this study and by using a TOE framework, I provided the exploratory groundwork that was needed to understand the various technological, organizational, and environmental factors associated with the cloud adoption process. The results of the study constitute a snapshot of a single organization that trusted and adopted cloud computing; they were the first organization to do so in Ethiopia. Thus, future studies should seek to involve a broader group of participants who represent multiple governmental organizations within Ethiopia and across Africa. By interviewing other governmental organization stakeholders such as internal revenue services, future researchers may learn about the perceptions and experiences of the customers to determine whether or not an organization is fulfilling the needs and requirements of its consumers. Scholars should consider conducting a quantitative research study that validates the influence of the identified technological, organizational, and environmental negative factors across organizations in Africa. I would also recommend additional research study to employ data records that may show how various functional units exercise the technological, organizational, and environmental factors within the governmental organization. These records can assist in triangulating and validating the findings of the study.

Implications

Significance to Social Change

The implications of this study affect individuals, governmental organizations, and consumers. The selected organization is one of the essential pillars of economic growth

within a country. Evaluating the technological, organizational, and environmental factors of an organization cloud computing adoption is vital to both achieving transformative positive change in service implementation and mitigating the consequences of service failures. This study involved exploring various technological, organizational, and environmental negative factors that were critical to the success of having a stable cloud-based service at the individual, corporate, and government levels. Improving cloud-based services for the organization can directly influence the economic growth of the country.

The successful implementation of cloud-based services reduces consumer frustration and the effort and time that were required to obtain the services and to resolve service-related issues. Successful implementation not only promotes customer retention but also reduces the number of challenges that consumers experience when they shift from on-premises to cloud-based services. The stability and availability of the cloud-based services ensure reliable access to e-commerce, online ticketing, and social media for customers; interruptions in service can, after all, lead to significant losses for online businesses, financial organizations, and other industries. Thus, the findings of this study may serve as the groundwork for improving services for consumers.

Significance to Theory

The findings of the study, in conjunction with the TOE framework and DOI theory, contribute to the body of existing knowledge regarding how a governmental organization in Ethiopia overcame the factors that adversely influenced managers of other organizations to the extent that they distrusted and decided against adopting cloud computing for e-government services. For instance, Low et al. (2011) combined the TOE

frameworks and DOI theories to understand the determinant factors of cloud computing adoption in high-tech organizations. The potential contribution of this study to the field of ICT encompasses the opportunities that were created for managers to help them to understand the benefits and risks of adopting cloud computing for e-government services.

A technology-enabled organization can benefit from the TOE framework perspective that was provided by the DOI systems theory. Exploring the technological, organizational, and environmental negative factors associated with the organization's service provisioning using a TOE framework and DOI theory perspective led to identifying the critical positive and negative factors that can reduce service-provisioning failures and increase successful deployments. The transformation from local ICT-based computing to a new cloud-based computing uprising helps to reduce waste by considering an adaptive, energy-efficient, and environmentally-friendly system (Balasooriya, Wibowo, & Wells, 2016). The theory and practice part of this study along with the cost savings that organizations would achieve by adopting cloud computing for e-government services, both directly and indirectly, could contribute to positive social change and environmental sustainability.

Significance to Practice

A lack of trust in cloud adoption and not being able to reach the customers at their convenience led to unpredictable consequences for organizations that not only affect their bottom line but also means that employees experience demotivation, frustration, and low morale. Successful implementations of cloud computing for e-government services will promote an environment of increased employee motivation, productivity, and morale, as

well as positive social change. In presenting the findings of this study, I provided decision-makers with an understanding of accessibility, availability, flexibility, and cost-effectiveness of the solution that can help to improve the levels of sales, customer satisfaction, and motivation of employees at their organizations. Successful cloud-based service implementations can reduce customer frustration and increase customer retention, which can help to reduce the cost of building local infrastructure to support customers' needs.

Conclusions

The purpose of this case study was to provide a deeper understanding of how a governmental organization in Ethiopia overcame the factors that adversely influenced managers of other organizations to the extent that they distrusted and decided against adopting cloud computing for e-government services. Many organizations in Ethiopia consistently experience various issues while endeavoring to provide high-quality services to its customers. These issues threaten the long-term survival of the organization, primarily due to dissatisfied customers, a loss of revenue, and failure in customer retention. Identifying the critical negative factors that were typically associated with the cloud computing adoption process could help managers to trust and adopt cloud computing by enabling them to overcome such factors.

Although this study had limitations that researchers may overcome in future research, the overarching benefits of the study may serve as the groundwork for decision-makers in governmental organizations in developing countries to understand various technological, organizational, and environmental negative factors that can help to

overcome the factors that adversely influenced managers of other organizations to the extent that they distrusted and decided against adopting cloud computing for e-government services. The findings of this study could indicate the importance of the organization incorporating the TOE framework and DOI theory to overcome the negative factors and adopt cloud computing services. Moreover, in this study, I highlighted the importance of keeping critical information safe by proposing a process that extends from identifying to hiring service providers, signing a legally-binding agreement with service providers, and creating a step-by-step approach to the cloud. Therefore, decision-makers, managers, planners, and implementers must consider the influence of the identified technological, organizational, and environmental negative factors that have been associated with cloud service provision, as well as enhancing their policies and processes to improve the success of cloud-based service implementation.

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Appendix A: Interview Protocol

A. Interview Preparation Activities:

- Procure digital audio recorder and verify equipment.
- Procure required stationary i.e. notepads and pen.
- Print copies of the interview protocol and consent form.
- Review interview protocol and interview questions.
- Verify the interview site for suitability and ensure a supporting environment.

B. Interview Activities:

- Contact the authorized manager (gatekeeper) in the organization to introduce me to the potential participants who are a manager in the organization.
- Send a recruitment letter (Appendix A) to each manager who will participant in this study along with a consent form (Appendix B).
- Follow up with a phone call to each potential participant to ask for their participation and answered any concerns they may have.
- Explain the goal of the interview, obtain his/her permission, schedule an appointment, and agree on the site where the interview will take place.
- Gain participants signature on the consent form.
- Start the semistructured interview starting with an introduction of myself, and the research topic as well as creating a bond with participant.
- Present the recording devices such as mobile and scribe-writing folders such as OneNote.
- Start the interview with open-ended questions.
- Review the questions, follow up with clarification as required, and summarize each answer for clarity.
- Maintain confidentiality throughout the interview.
- Encourage the participants to respond to the questions freely and comfortably.
- Finally, acknowledge the participants for their effort to answer the questions and taking the time participating in this study.

C. Post Interview Activities:

- Verify recordings to ensure that questions and answers were captured.
- Compile personal reflections.
- Validate if follow-up interview is required.
- Submit recordings for transcription.

Appendix B: Semistructured Interview Questions

Overarching general research Question.

How a governmental organization in Ethiopia overcame the factors that adversely influenced managers of other organizations to the extent that they distrusted and decided against adopting cloud computing for e-government services?

Interview Questions by Category:

General

1. What is your position in your organization?
2. What is your role in cloud adoption for e-government services project?
3. What is the current trend of ICT in your company? More precisely, what are the leading technologies that are being used?

Technology

4. What were the technical negative factors involved for managers not to trust and adopt cloud computing for e-government services?

Organization

5. What were the organizational negative factors involved for managers not to trust and adopt cloud computing for e-government services?

Environment

6. What were the environmental negative factors involved for managers not to trust and adopt cloud computing for e-government services?

Overcoming the factors

7. What processes were taken by managers linked with the service providers to have them maintain the privacy and security of their sensitive data, so your organization can trust cloud computing services?
8. How did you and other managers and decision-makers overcome all the negative factors that influence you and other not to trust and adopt cloud computing for e-government services?
9. How do you think trust and adoption of cloud computing can be built?
10. What are your recommendations for other managers who are reluctant to trust and adopt cloud computing for e-government services?
11. Is there anything else that you would like to add to our conversation that might be relevant?

Appendix C: Semistructured Observation Guide

Overarching general research Question.

How a governmental organization in Ethiopia overcame the factors that adversely influenced managers of other organizations to the extent that they distrusted and decided against adopting cloud computing for e-government services?

Semistructured observation is the second sources of data gathering instrument by watching events or behavior in its natural environment. I will use semistructured observation method for better understanding of the participants with their team interaction on e-government services and the network environment that supports cloud computing for e-government services.

Therefore, I am planning to:

1. Use overt observation, which requires to be open about the study intentions and inform the participants to make sure they are aware of what is happening.
2. Participate up to three e-government services strategies meetings.
3. Visit the selected organization's data center, network infrastructure, and applications that are used to access cloud computing.

Semistructured Observation Guide.

- How has the project been implemented?
- How are the project team members behaving?
- How are the project team members interacting?
- How was the network setup for cloud computing?
- What kind of last-mile setup do they have?